Critical Thinking in Practice

Teachers' interpretation and translation into practice of critical thinking in the A level classroom – an ethnographic perspective.

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CRITICAL THINKING IN PRACTICE:
TEACHERS' INTERPRETATION AND TRANSLATION INTO PRACTICE OF CRITICAL THINKING IN THE A LEVEL CLASSROOM – AN ETHNOGRAPHIC PERSPECTIVE

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Abstract

Although the Critical Thinking field is replete with theoretical models and conceptualisations of what Critical Thinking is deemed to be, there is a consensus that such theoretical perspectives are yet to transfer pedagogically to the classroom. This thesis addresses the disjuncture between Critical Thinking theories and pedagogical enactment through a practice based exploration of three A level teachers' interpretation and translation into practice of a trans-disciplinary model of Critical Thinking in one secondary school.

Research was conducted from an ethnographic perspective, drawing on the tools of observation, formal interviews, teacher commentaries on lessons, as well as textual analysis of relevant documentary evidence related to the teaching context. 18 lessons were video and audio recorded, with audio recordings of selected lessons and associated teacher commentaries transcribed for systematic linguistic analysis in accordance with micro-ethnographic methods. Each participant teacher constituted an individual case study.

A significant dynamic to emerge from this thesis was the relationship between Critical Thinking as outcome, contextualised and rendered visible in this study by each subject's A level specifications, and Critical Thinking as pedagogical process, enabling students to achieve such outcomes. Based on a constructivist view of teacher professionalism, this research reveals how teachers engaged in their own individual critical processes of interpreting, selecting, reformulating and blending the Critical Thinking model with other pedagogic conventions in order to address specific epistemological difficulties presented by their respective A level, rather than pursuing Critical Thinking as a pedagogic aim in its own right. As a result, Critical Thinking in this study assumes its significance and meaning through each teacher's translation of it into the context of their practice, manifesting itself in their own situationally relevant enacted pedagogy.

Whilst the focus in this thesis has been Critical Thinking, it also serves at a meta-level as a study into the processes at play when grand pedagogical concepts are brought to real classrooms.

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Abbreviations

Abbreviation	Meaning
ALPS	A Level Performance Systems
AO	Assessment Objective
AS/A2	Advanced Subsidiary was the exam taken half way through the two year A level course. A2 was the programme taken in the second year of the A level. AS + A2 constituted the full A level, prior to A level exam reform started in 2015
A Level	Advanced Level
AST	Advanced Skills Teacher
DfE	Department for Education
EAL	English as an Additional Language
GCSE	General Certificate of Secondary Education
GTP	Graduate Training Programme
NQT	Newly Qualified Teacher
Ofqual	Office of Qualifications and Exam Regulations
Ofsted	Office for Standards in Education
PCK	Pedagogic Content Knowledge
PGCE	Post Graduate Certificate in Education
QCA	Qualifications and Curriculum Authority
RS	Religious Studies

Chapter 1 Introduction

The purpose of this research is to provide a practice-based examination of Critical Thinking as presented through three teachers' interpretation of a Critical Thinking model and how they translated it into their A level teaching of politics, biology and philosophy. This thesis, therefore, serves as an investigation into the theory-practice divide that appears to exist within the field of Critical Thinking. At a meta-level, this research also constitutes a study of the processes in operation when grand pedagogical concepts, in this case, Critical Thinking, are taken up by teachers and enacted in their classrooms. This introduction is divided into four parts: firstly, I provide an overview of the context which has given rise to the aims of this research and in which I trace the origins of my research questions; secondly, I briefly outline the scope, orientation and limitations of this research; thirdly, I explain the status and function of theoretical perspectives in the context of this practice-based study; and finally I present an outline of the chapters to follow.

1.1 The Context of the Research

The context of this research consists of two interconnected domains: firstly, I examine the context of the Critical Thinking field itself explicitly in relation to pedagogical concerns; and secondly, I outline the specific school context which gave rise to the Critical Thinking practice featured in this research. I also illustrate how the integration of these two contexts led to the formulation of my final research questions.

1.1.1 Critical Thinking

An examination of the research literature provides a clear consensus on a valued goal of education being able to produce independent critical thinkers (Siegel, 1988; Halpern, 1997; Ennis, 1997; Lipman, 2003; Moseley, Baumfield, Elliott, Gregson, Higgins, Miller & Newton, 2005; Paul & Elder, 2006; Mason, 2007; Davis & Barnett, 2015), yet it also documents the apparent failure of education systems, both in the United Kingdom and internationally, to achieve that goal (Paul, Elder & Bartell, 1997; Pithers & Solden, 2000; Willingham, 2007; Sale, 2007; Birkhead, 2009; Stapleton, 2011; Davis & Barnett, 2015). The gap between the desired objective and the educational reality is seen to be of political concern, given the globalised premium on ideas and innovation and the subsequent importance of 'intellectual

capital' (Tan, 2006, p.89) required for success in the 21st century knowledge based economy (Hargreaves, 2003; Rotheram & Willingham, 2009; Stiansky & Gore, 2014). Such a concern has prompted explicit government policy to promote the teaching for Critical Thinking in a variety of educational jurisdictions including the United States, Singapore, China and Hong Kong. In England, the National Curriculum, in its various iterations, has made reference to enabling 'pupils to think critically … to solve problems' (QCA 2004, p.11), with the revised National Curriculum from 2013 moving from generic to specific references to Critical Thinking in individual subject programmes of study (Department for Education, 2014). Critical Thinking, therefore, appears to be presented as a body of principles which constitute an additional dimension to the curriculum. The overarching concern of this research is, therefore, to investigate how this additional body of ideas is taken up by subject teachers and how they enact such principles in their subject specific classrooms.

However, the little empirical research evidence that exists from classrooms suggests such policy pronouncements and curriculum aims have yet to have an impact on teachers' practice (Paul, 2005; Tan, 2006; Willingham, 2007; Li Li, 2011; Stapleton, 2011).

The failure of Critical Thinking to take root in the classroom, or what has been described as Critical Thinking's 'unresolved problem of pedagogy', (Bereiter, quoted in Dean and Kuhn, 2004, p.269) has been attributed in the literature to a range of factors, including:

1. The lack of clarity on the part of teachers over what is actually understood by the term 'Critical Thinking' in the face of multifarious definitions and conceptualisations (Moseley et al, 2005; Paul, 2005; Moon, 2008; Stapleton, 2011; Davis & Barnett, 2015).
2. The absence of any consensus by theorists and also by educators of how Critical Thinking applies within the context of individual disciplines (Sale, 2007; Hale, 2008; Jones, 2015).
3. Little communication between theorists with philosophical conceptualisations of Critical Thinking and teachers in search of practical classroom applications (De Corte, 2000; Moore, 2011b).
4. The focus of models and theories on Critical Thinking outcomes rather than on the pedagogical processes to support those outcomes (Bailin, Case & Daniels, 1999b; Thayer-Bacon, 2000; Moon, 2008).

5. Teachers having to operate within the culture of a ‘high stakes’ assessment system where teaching to the test dominates (Tan, 2006).

A further scrutiny and distillation of these five factors appears to yield three distinct yet interrelated threads to pursue when examining teachers’ application of Critical Thinking models in the context of their classrooms. Indeed, it is these three areas which inform my final research questions, as will be shown later in this Introduction.

Firstly, to attribute the failure of Critical Thinking taking root in the classroom to ‘a lack of clarity’ on the part of educators of what Critical Thinking ‘is’ implies a normative view of Critical Thinking adopted by some theorists. Rather, in place of ‘a lack of clarity’, it might be more accurate not only to acknowledge the diversity of Critical Thinking definitions and conceptualisations within the literature (Moseley at al, 2005) but also to accord a significance to the different beliefs, values and interpretations teachers themselves bring to the context of Critical Thinking in their classrooms. In other words, if we wish to understand what is happening in terms of Critical Thinking in the classroom, it is key to understand what actual teachers think, understand and interpret Critical Thinking to be, rather than to determine teachers’ understanding of Critical Thinking as somehow deficient in terms of a particular Critical Thinking model. Furthermore, given that teachers tend to operate within a disciplinary context, which is certainly the case in relation to this particular study, it is assumed that a subject specific dimension may also contribute to their understanding and interpretation of Critical Thinking. So, a key area to examine in relation to Critical Thinking as enacted by teachers in their classrooms, would be to explore their interpretations of the concept and how their disciplinary context might bear on such an interpretation.

A second thread emerging from the issues identified above, drawing on issues 2, 3 and 4, is the apparent disjuncture between theoretical perspectives on Critical Thinking and practical pedagogical applications. In other words, theorists appear to focus predominantly on what Critical Thinking ‘is’ in terms of the criteria or outcomes which would corroborate the ‘presence’ of Critical Thinking, rather than on the pedagogical processes which would enable students to achieve such outcomes in a disciplinary specific context. As such, according to the literature, there appears to be little emanating from theorists in terms of how Critical Thinking, in whatever form it is conceptualised, is realised pedagogically in the context of the classroom. A second key area to examine, therefore, in the context of teachers’ approaches

to Critical Thinking, is the relationship between their interpretation of Critical Thinking and their translation of that interpretation into pedagogical practices within the context of their respective disciplines.

The third and final factor, which builds on the second thread referred to above, draws on issues 2, 4 and 5 in terms of examining Critical Thinking pedagogical practices in the context of a high stakes assessment system where, as will be developed further in the theory chapter (ch.2), teaching to the exam may account for what might be termed a reductionist or performance oriented approach to teaching, mitigating against pedagogical approaches which would foster the skills and dispositions to enable students to develop as Critical Thinkers. The disciplinary dimension is also explicit here, given that assessments are normally within a subject context. Indeed, the high stakes assessment context featured in this study is that of AS and A level examinations in philosophy and ethics, politics and government, and biology, each of which has very clear expected outcomes articulated in their respective A level specifications. So, a further area to examine is teachers' Critical Thinking pedagogical practices in the context of high stakes examinations and their associated expected disciplinary specific outcomes.

In summary, there are three key and interrelated areas I have distilled from the five issues identified in the literature to inform this practice-based study of teachers' use of Critical Thinking. These comprise the following:

- How individual teachers interpret the concept of Critical Thinking.
- The relationship between teachers' interpretations of Critical Thinking and how such interpretations are translated into pedagogical processes within disciplinary specific contexts.
- The interplay between teachers' Critical Thinking pedagogical practices and disciplinary specific expected outcomes in the context of high stakes examinations.

It will be shown below (see p.14) how these three areas directly inform the research questions governing this study.

It should also be noted that if issues arising from the literature referred to above reveal that the field of Critical Thinking is heavily weighted in terms of theoretical and philosophical conceptualisations at the expense of practical pedagogical considerations, this weighting is further illustrated by the dearth of actual empirical research on how theoretical perspectives

might inform an effective pedagogy for Critical Thinking (Hale, 2008; Moore, 2011a; 2011b), especially for the secondary school (Tsui, 2002). As a result, the demand for research where 'we need to continue research on the kinds of classroom experiences that help students to meet these goals [of Critical Thinking] regardless of what we name the course' (Haroutunian-Gordon,1998, p.424) still seems to hold true . In other words, 'teaching Critical Thinking from kindergarten to Year 12 students is ripe for investigation', (Flores, Matkin, Burbach, Quinn & Harding, 2010, p.15). My thesis, therefore, by focusing on specific teachers' practice in relation to Critical Thinking can be seen as a contribution to such classroom research which aims to bridge the apparent divide between Critical Thinking as theory and Critical Thinking as pedagogical practice. This is now elaborated upon further in terms of the school context of this research.

1.1.2 The School Context

At the time of conducting the research (2013), a group of self-selecting teachers from N School, a comprehensive school in West London for students from the ages of 11 to 18, had been engaged in a professional development study group programme from September, 2007, exploring a model of Critical Thinking developed by Richard Paul (Paul et al, 1997). This had been prompted by a specific concern identified by teachers of the apparent inability of students to transfer high level academic success at GCSE at the end of Year 11 into corresponding achievement at the highest grades at AS and A level in Years 12 and 13 (collectively known as the Sixth Form), thus limiting access to the more competitive degree courses and universities[1]. As a middle leader in the school, at that time, with a curriculum interest in sixth form provision, I developed a Critical Thinking professional development programme with the aim of promoting an approach to classroom teaching that would foster amongst sixth form students greater intellectual engagement, conceptual understanding and associated academic discourse with more adaptive dispositions towards learning. Critical Thinking as featured in this research is, therefore, grounded in a particular school environment with a clear rationale as to why these teachers were working with it. As such it provided a naturally occurring opportunity to examine at close quarters what three teachers were 'doing' with Critical Thinking in their classrooms. In this context, it is important for me to

[1] This research was conducted during a period of significant curriculum change at A level. The implications of this research for the subsequently reformed A levels introduced from 2015 will be examined in the conclusion.

signal that Critical Thinking is not, in this study, treated as a subject in its own right. Rather, as indicated above, this investigation is concerned with how the body of Critical Thinking theories and approaches, with a particular focus on Paul's trans-disciplinary model, have been interpreted and enacted in teachers' disciplinary classroom practices over time.

As a result of my examination of the five issues identified by the literature and my distillation of them into three discernible but closely interrelated threads, as outlined above (p.12), this investigation into these teachers' interpretation and translation into practice of Critical Thinking was governed by the following three research questions:

1. How do the participant teachers in this study interpret the term 'Critical Thinking'?
2. How do these teachers' translate their interpretations of Critical Thinking into pedagogical practices in their disciplinary specific A level classrooms?
3. How does the context of teaching for high stakes AS and A level examinations with their associated disciplinary specific expected outcomes bear on the Critical Thinking pedagogical practices presented by these teachers?

By drawing on an ethnographically informed approach to three teachers' interpretation and use of Critical Thinking, this thesis, therefore, constitutes a response to the call for research into classroom experiences that foster students' ability to think critically. Through a close examination of teachers' classroom practice, it aims to shed light on the 'unresolved problem of pedagogy' within the field of Critical Thinking, and will therefore make a contribution to redressing the theory-practice imbalance, referred to above.

1.2 Scope, Orientation and Limitations of the Study

Given the purpose of this study is to investigate three teachers' interpretation of Critical Thinking and how they translate it into their A level teaching, this research clearly constitutes a practice-based examination of Critical Thinking, as opposed to a theory driven study. As such, it aligns with Shulman's concept of the scholarship of teaching by being 'learning-focussed, domain specific, and orientated towards analysing educational experiences and outcomes …' (Shulman, 2004, p. 161), which is made public, open to critique and evaluation. The orientation of this study is therefore one of an exploratory narrative, which focuses on

describing what happens in order to understand the phenomenon of Critical Thinking in the context of three teachers' classrooms, rather than to prove 'what works' (Shulman 2004). As this study concerns itself with three specific cases, there will be limitations on what claims can be made on its behalf, given the small sample size and the nature of case study methodology. However, based on the principle of analytic generalisation (Yin, 2014), as will be developed further in the methodology chapter (ch.3), the findings from this study may have a wider resonance in understanding the development of Critical Thinking and pedagogical practices beyond that of the immediate context of the research. Indeed, the study serves at a meta-level as an example of the inter-relationship between wider theoretical frameworks and local contexts (Cochrane-Smith & Lytle, 2009) by illustrating what happens when teachers take hold of a theoretical pedagogical concept, such as Critical Thinking, and by examining their enactment of it in the context of three real classrooms.

It should be noted, however, that in this study the focus is specifically on teachers' understanding and pedagogical actions. Whilst it is not possible to divorce student learning from teaching, students' contributions feature in this study in terms of what they illustrate in relation to their teachers' pedagogic choices. As a result, the emphasis in this exploration of Critical Thinking is on the teacher, rather than the student.

1.3 Theoretical Perspectives

Given this study is a practice-driven account, and that such classroom practice is itself comprised of rich and dynamic complexities which resist being constrained by a few theoretical concepts (Murphy, 2008), theory is drawn on in this study as determined by teachers' practice. In this context, I draw on the conceptual lenses provided by Eraut's (1994; 1998) personal and public propositional knowledge, and action knowledge; Ball, Maguire & Braun's (2011) concepts of 'interpretation' and 'translation'; and Shulman's (1986) pedagogic content knowledge (PCK), all of which serve to underpin a constructivist conceptualisation of teacher knowledge and practice. Additionally, I draw on Bernstein's (2000) concepts of visible/invisible pedagogies and classification to illuminate the complexity of what appears happening in these classrooms. These theoretical perspectives will be elaborated upon further in the theory chapter (ch.2).

The term 'Critical Thinking' itself, as will become apparent, is a multi-faceted construct which defies a simple definition. In chapter two I examine a selection of conceptualisations relevant to this study which are developed further through the teachers' own conceptualisations and use as presented in the subsequent data chapters (chs.4-6). However, a key distinction to signal here in relation to the use of the term in this study is what I later refer to as Critical Thinking as outcome and Critical Thinking as pedagogical process to foster such outcomes, which will also be examined more fully chapter two, and illustrated in the data in chapters four, five and six.

Richard Paul's trans-disciplinary model of Critical Thinking[2], which is the model used in the professional development programme and with which the teachers in this study had engaged, is outlined in chapter two. It should be noted that the professional development programme itself is not an explicit feature of the research, but it is rather what teachers subsequently did with it in the context of their A level classrooms which is the focus for study. Details of the programme can be found in appendix A.

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1.4 Outline of the Chapters

As indicated above, theory is drawn on as determined by the pedagogical practice featured in this study. Chapter two, therefore, examines theoretical perspectives in two parts: firstly, those arising from the field of Critical Thinking itself, especially as relevant to the issue of pedagogy, which is the primary concern of this study. Part two addresses issues pertinent to teachers' professional practice and particularly to those factors that might influence the nature of their engagement with theoretical pedagogical models. Chapter two, therefore, provides the theoretical hinterland for the practice which will be in sharp relief in the subsequent data chapters. In chapter three, I outline my methodological choices which align clearly with the primary purpose of this thesis: to examine closely teachers' understanding and application of Critical Thinking in their classrooms. As such, I draw on the traditions of ethnographic perspective; case study; and micro-ethnography which, in turn, inform the data collection methods adopted. It is in this chapter that I also address issues arising from my dual role of researcher and practitioner responsible for the development of the school's

[2] Richard Paul was part of group of thinkers collectively known as the Critical Thinking Movement based mainly in the US from the late 1980s onwards. Along with Siegel (1988); McPeck (1990); Ennis (2001) and Lipman (2003), he was considered to be amongst the more theoretically grounded thinkers in the field (Moore, 2011b, p.16).

Critical Thinking programme. Chapters four, five and six constitute the three individual case studies consisting of: teacher M, teacher of A level politics; teacher J, teacher of A level biology; and teacher L, teacher of AS level philosophy and ethics. In chapter seven, I draw together the findings from these individual case studies and I discuss them collectively in relation to my three research questions, and, where apposite, I make use of the theoretical perspectives from chapter two to illuminate the processes at play. In the final chapter, chapter eight, I revisit the purpose and theoretical context of the research. I review and reflect on my overall findings through a synthesis of the key manifestations of Critical Thinking that appear to emerge from the answers to my research questions. I examine the implications of the research in terms of its status as a local study for the wider fields of Critical Thinking, pedagogy and teacher professionalism. I also examine the relevance of this study in the context of A level exam reform in which I suggest my findings would be equally pertinent. Finally I make further suggestions for research arising from this study.

Chapter 2 Theoretical Perspectives

As was outlined in the Introduction, the purpose of this thesis is to present a practice-based exploration of Critical Thinking and therefore the pedagogical practices of the three participant teachers featured in this research provide its key focus. My aim in the theory chapter is, as a result, to examine the issues and debates in terms of Critical Thinking, pedagogy, and teacher professionalism as directly pertinent to this practice-based study. In other words, as indicated in the Introduction, this chapter provides the theoretical hinterland for the practice that will feature in the data and discussion chapters (chs. 4-7).

This chapter consists of two parts, each examining a key area related to the research. Firstly, I examine the literature from the field of Critical Thinking itself with an overview of specific theoretical perspectives as relevant to this research. Given this study's focus on teachers' translation into practice of a Critical Thinking programme, the pedagogical issues in relation to Critical Thinking are foregrounded in this part of the chapter, with a key concern being the pedagogical 'transfer' of Critical Thinking theoretical models into classroom practice, as outlined in the Introduction. The second part of this chapter, consequently, consists of an investigation into the literature related to the link between professional practice and teachers' engagement with theory where I examine those factors influencing pedagogical choices made in the context of the classroom. At this juncture, I also review selective Bernsteinian concepts related to visible/invisible pedagogy; and weak/strong classification of disciplines, which will serve to illuminate further the narrative presented in the thesis.

2.1 Critical Thinking

Given this study aims to contribute to a call for research into the pedagogical application of Critical Thinking theoretical models (Hartounian-Gordon, 1998: Tsui, 2002; Hale, 2008; Flores et al, 2010; Moore, 2011b), it is, therefore, beyond its scope to present in full the range of philosophical debates that play out in the field of Critical Thinking. I therefore focus in this part of the chapter on Critical Thinking in the context of the pedagogical concerns highlighted in the Introduction (ch.1) which are divided into two sections: firstly, I focus on Critical Thinking per se through an examination of relevant theoretical perspectives and their implications for pedagogy. This includes issues around defining and conceptualising Critical

Thinking, which leads to an examination of four specific conceptualisations of Critical Thinking including Paul's trans-disciplinary model. I then explore an apparent theoretical overlap between Critical Thinking and other 'professional theories' (O'Hanlon, 1993) or pedagogic conventions held within the field of education which appear to align with what might be termed a Critical Thinking based pedagogy. These consist of Bloom's taxonomy; socio-constructivist approaches to teaching and learning; and metacognition. It is also at this juncture that a key distinction identified in chapter one is highlighted, which is Critical Thinking understood as a set of outcomes or criteria contrasting with Critical Thinking seen in terms of pedagogical processes to support such outcomes.

2.1.1 Definitions and Conceptualisations

In this section, I examine issues around defining and conceptualising Critical Thinking and the challenges these raise for teachers in terms of practical applications. In this context I explore four particular conceptualisations of relevance to the pedagogical practice featured in this research: Critical Thinking as argument; a normative conceptualisation of Critical Thinking; Critical Thinking as being disciplinary specific; and Paul's trans-disciplinary conceptualisation of Critical Thinking.

It may often be assumed by teachers and educationalists that terms such as Critical Thinking, being widely used within the field, have an agreed or an assumed meaning (Moon, 2008). This is illustrated in the context of this research by the A level specifications for a range of subjects where the terms 'critical thinking', 'critical', 'critically', or 'criticality' appear liberally in assessment objectives and performance descriptors for the higher grades, but are rarely operationalised or defined (see appendix B). It seems somewhat paradoxical, therefore, that in the face of a consensus of Critical Thinking being desirable or even a required outcome for academic courses, there is no similar agreement on what Critical Thinking actually is, which presents a clear problem for the practitioner wishing to develop such thinking in the classroom. The more frequently used definitions from key theorists in the field include:

- 'Reasonable, reflective thinking that is focused on deciding what to believe or do' (Ennis, 2001, p.44).
- 'Thinking that is purposeful, reasoned and goal directed' (Halpern, 1997, p.4).
- 'To be appropriately moved by reasons' (Siegel, 1988, p.32).
- Thinking that 'facilitates judgement because it relies on criteria that is self-correcting and sensitive to context' (Lipman, 2003, p.212).

- ‘The propensity and skill to engage in an activity with reflective scepticism’ (McPeck, 1981, p.18).
- ‘Critical Thinking is the art of thinking about your thinking in order to improve your thinking’ (Paul & Elder, 2006, p. xvii).

Indeed, Moseley et al (2005) have collected over 40 definitions in their meta-analysis of Critical Thinking frameworks which they argue gives an overall impression of diversity and subjectivity rather than clarity. This rather confused state is epitomised by Facione’s report from the American Philosophical Association’s expert panel, where a consensus statement on Critical Thinking reads as follows:

> ‘*We understand Critical Thinking to be purposeful, self-regulatory judgement which results in interpretation, analysis, evaluation and inference, as well as explanation of the conceptual, methodological, criteriological or contextual considerations upon which that judgement is based…’* (Facione, 1990, p.3).

Indeed, it has been suggested that such a definition, in an attempt to capture the multi-faceted nature of the concept, ends up by being too wide reaching to be of any real value as a working definition to inform pedagogical approaches (Davis and Barnett, 2015).

However, the issue becomes even more complex once attempts are made to turn definitions into ‘a defensible conception’ of Critical Thinking of use to educators (Bailin et al, 1999b, p.286). Barnett aptly summarises the issue by stipulating that Critical Thinking remains ‘one of the defining concepts in Western education which enjoys wide endorsement [and] yet we have no proper account of it’ (quoted in Davis and Barnett, 2015, p.5).

Whilst it is beyond the scope of this thesis to examine the full range of conceptualisations of Critical Thinking to be found in the literature, I will examine those of relevance to this study in terms of their implications for pedagogy. These are: Critical Thinking conceived in terms of logical argument; Critical Thinking as an amalgam of wider reasoning skills, standards and dispositions; Critical Thinking as being disciplinary specific; and a trans-disciplinary model of Critical Thinking.

2.1.1.1 Critical Thinking as Logic and Argument

Paul (1997, no pages), in his review of the Critical Thinking movement, identified the first wave of the movement coming from the field of philosophy, ‘based on a focus of the theory of logic, argumentation, and reasoning’. With its origins in formal and informal logic, issues that concern the quality of argument seem to be part, but not the totality, of a broader picture of Critical Thinking. Indeed, the literature on Critical Thinking and argument does appear to

identify an overlap between the two fields with Siegel (1988) amongst others (Govier,1989; Hoaglund, 1993; Warburton, 1995; Fisher, 2001; Andrews, 2015) who, to varying degrees, consider that reasoned argument may constitute an aspect of Critical Thinking with a focus on the formulation of propositions supported or tested with evidence; logical links pursued between propositions; rebuttals to challenge propositions; the formulation of clearly reasoned conclusions (Fisher, 2001) which, collectively, combine to constitute 'a train of reasoning' (Fisher, 1988, p.1). As will be shown in the data chapters (chs.4-6), 'argument' features in all three of the A level subjects in this study as the rhetorical mode in which students are expected to organise and represent their reasoning. Whilst it is beyond the reach of this study to explore the wider debates around the disciplinary specific or generic forms of argument (See Andrews & Mitchell, 2001; Toulmin, 2003; Andrews, 2009; 2015 for a further discussion), it does herald similar issues in relation to Critical Thinking to be explored further below in terms of subject specificity.

It should be noted that whilst Critical Thinking and argument may be closely allied or overlap, they do not appear to be interchangeable concepts (Andrews 2009; 2015). Indeed, as Paul (1997) has identified, Critical Thinking, in a further wave, has been conceptualised more broadly to encompass a wider range of skills beyond that of argument and logic. In this regard, Paul, with other theorists, has also emphasised the concept of Critical Thinking 'standards' against which the quality of thinking can be assessed, along with the importance of the dispositions or attitudes deemed to be key features of an effective Critical Thinker (Seigel, 1988; Bailin et al, 1999a;1999b; Lipman, 2003; Winch, 2004; 2006). This composite view has been termed a 'normative' conceptualisation of Critical Thinking (Moseley et al, 2005, p.19) which I will now develop.

2.1.1.2 A Normative Conceptualisation of Critical Thinking

From the normative perspective, proficiency in a wider range of skills beyond that of argument is necessary for a comprehensive view of Critical Thinking. Such skills include: hypothesising, interpreting, classifying, problem solving, analysing, evaluating, and making conceptual links (Halpern,1997; Lipman, 2003; Nosich, 2008). However, such skills are not deemed to be sufficient by themselves to constitute 'Critical Thinking'. As Bailin et al (1999a) argue, it is not about students doing such tasks; it is how well they accomplish them.

In other words, it is the quality of the process adopted that distinguishes between a critical and uncritical thinker, not the process or skill itself, or, as Lipman (2003, p.76) puts it,

> '*We will not be able to get students to engage in better thinking unless we teach them to employ criteria and standards by means of which they can assess their thinking for themselves.'*

Indeed, such a position, by making explicit what students need *to do,* and therefore, by implication, what teachers need to teach them, signals a point at which Critical Thinking appears to cross over from what it is meant *to be,* from a theoretical perspective, into the pedagogical sphere. This will be examined further in section two where an explicit link is made between metacognition and Critical Thinking, and this will also be further illustrated by the pedagogical practices featured in the data chapters (chs. 4-6).

A further dimension of the normative conceptualisation is the role of dispositions or what Siegel calls the development of the 'critical spirit' (Siegel, 1988, p.39). This has its origins in the Platonic and Aristotelian tradition of Virtue Ethics (Gottleib, 2000) where virtues such as wisdom, courage, temperance and justice (Plato, 1993) are blended with, and are deemed to be inseparable from, the pursuit of reason. Building on this classical notion of 'Virtue', Critical Thinking is not seen as only consisting of evaluative competence, it also entails dispositions which move thinkers to *want* autonomously to assess the quality of their thinking (Winch, 2006). As such, the inclusion of 'dispositions' in the normative conceptualisation means Critical Thinking, in this iteration, makes another move from what Critical Thinking *is*, to what a Critical Think*er* does. In this context, Critical Thinking appears to involve a dimension of character development which could be said to be evocative of a liberal-democratic tradition of education where preparation for autonomy is an overarching aim (see Winch, 2004; 2006, for further discussion).

The implication for pedagogy of the normative position is not straightforward. In terms of dispositions, the desirability of having students with intellectual courage and autonomy, a thirst for the pursuit of reason, an enquiring attitude and an intellectual work ethic is beyond question for most educators, but poses the challenge of developing a pedagogy that orchestrates opportunities for students to develop and demonstrate such dispositions. Indeed, it raises a question of how such normative ideals of 'intellectual autonomy' and 'intellectual courage', for example, may translate into an achievable reality in the context of a school classroom. Similarly, in relation to standards, all teachers would want to promote

high quality thinking that was clear, precise and relevant, but how this is translated into a practical pedagogy is not so evident.

Furthermore, as Bailin et al (1999b, p.291) have pointed out, such standards are not necessarily generic but emerge from practice, where 'standards of Critical Thinking…are discovered by analysis of our critical practices' and are applied in context according to the 'area of intelligent human inquiry and practice whether that be science, art, law or a moral issue'. However, by characterising standards as being determined by the context of the discipline, Bailin et al (1999b) refer to the issue already signalled with reference to domain dependent argument (see p.23 above): that is whether Critical Thinking comprises a set of generic skills that can be applied or transferred across a range of contexts; or whether Critical Thinking per se does not exist but is always situated in specific disciplinary contexts. The pedagogical issues that arise from a disciplinary specific conceptualisation of Critical Thinking will now be explored more fully below.

2.1.1.3 Disciplinary Specific Critical Thinking

McPeck (1981; 1990) has led the argument for epistemological domain specificity claiming that Critical Thinking in one domain is actually different from Critical Thinking in another,

> *'Critical Thinking cannot be divorced from the skills that make the activity what it is. For example, Critical Thinking about a historical question requires first and foremost the skills of a historian. Similarly, Critical Thinking about scientific questions requires the knowledge and skills of a scientist'* (McPeck, 1981, p.9*).*

Such a subject specific position appears to be supported more recently by Moore's (2011b) ethnographic study into teacher and student understanding of Critical Thinking in the three subject areas of philosophy, history and literature. He found clear distinctions in what constituted Critical Thinking in these disciplines, distinctions that were inextricably linked to their disciplinary context. Moore's conclusion that Critical Thinking is comprised of 'a multiplicity of practices that are rooted in the quite individual nature of different disciplinary language (and thinking) games' (2011a, p. 271) has implications for pedagogy. It follows, according to Moore (2001b), that teaching for Critical Thinking has to happen within a subject context, with the teacher making explicit the Critical Thinking structures inherent within the subject, along with their associated representations in written or spoken forms. Indeed, this subject specific conceptualisation of Critical Thinking appears to align with the concept of disciplinary discourse where 'disciplines stake out their territories…by claiming a

particular domain of objects, and by developing a unique set of methodological practices and by carrying forward a founding tradition and lexicon' (Nelson, Treichler and Grosberg, quoted in Moore, 2011, p.39). Similarly, further parallels can also be drawn with the field of Academic Literacies (Lillis, 2003; Lea & Street, 2006, Wingate, 2012) where 'the literacy practices of academic disciplines can be viewed as varied social practices associated with different communities' (Lea & Street, 2006, p.368).

In terms of pedagogy, there appear to be three implications of a disciplinary specific approach to Critical Thinking: firstly, teachers need to develop an approach which makes the distinctive nature of Critical Thinking in their individual disciplines more explicit and more comprehensible to students; secondly, students will need to be aware of having to learn a range of Critical Thinking skills across the diversity of subjects studied; and thirdly, teachers will need to help students acquire the literacy skills for representing this kind of thinking to others within the genres required by the discipline. Moore (2011b) recognises the potential risk of students becoming overwhelmed and confused by such differences. Yet, in the face of the weaknesses of a generic model of Critical Thinking, this call appears to lead to an impasse, encapsulated by Bonnet (1995, p.301),

> *'We can say on one hand that to require separate powers of the mind for every act of identification is absurd; yet, on the other, to claim generalizable powers begs the question of what they could consist in.'*

The answer to Bonnet's question may reside in moving away from the polarising debate of the generic/specific skills to a third approach: a trans- disciplinary conceptualisation of Critical Thinking which is conceptually flexible enough to be contextualised across disciplines and domains (Paul et al,1997; Hale, 2008; Moore, 2011a; 2011b). A trans-disciplinary model, it could be argued, might offer a metacognitive structure to enable students to access the 'Critical Thinking' inherent within different subjects by providing a means with which to navigate the epistemological requirements of alternative disciplines (Hale, 2008) or turn what Jones (2015, p.169) argues are the 'common elements' of Critical Thinking into what is 'in its practice and teaching, a disciplined act.' It is claimed that Paul's model may address such concerns (Hale, 2008).

2.1.1.4 Paul's Trans-Disciplinary Model of Critical Thinking

What has emerged from the discussion above is the need for an approach to Critical Thinking that provides an overall framework that can be used by teachers of all disciplines

but which, at the same time, brings to the fore the distinct epistemic identity of the discipline. In other words, such a model would represent a crossroads between ontology and epistemology where the model would constitute an ontology of Critical Thinking which, when applied to a disciplinary context, assumes a significance in the context of the epistemology of the specific discipline. This will now be elaborated upon further.

Paul's conceptualisation of Critical Thinking is essentially a meta-cognitive one where Critical Thinking is considered to be the art of breaking down or analysing your thinking, in order to assess the quality of that thinking, with an aim to improve it (Paul & Elder, 2006). As such, his model is constructed around three 'core concepts' presupposed in all disciplines to come to a 'baseline' definition of Critical Thinking or a minimum set of criteria that govern the quality of thinking common to all domains of thought (Paul et al, 1997). His approach is considered to be essentially a synthesis of a range of Critical Thinking definitions and usage drawing on a Western philosophical tradition incorporating principles of reasoning from the works of, for example, Socrates, Bacon, Locke, Dewey, Newman (Paul et al, 1997; Hale, 2008). In this sense he appears to be offering a response to the call from others within the Critical Thinking field to come to a practice-based conceptualisation, where 'thinking critically about Critical Thinking should allow one to process the dialectic nature of various constructs into a more integrative whole' (Flores et al, 2010, p.5).

The three core concepts that constitute Paul's ontology of Critical Thinking consist of the Elements of Reasoning, the Intellectual Standards, and the Intellectual Traits (Paul et al, 1997). These are defined as follows:

i) The Elements of Reasoning.
These comprise:
Purpose
Questions
Data/information
Concepts
Assumptions
Inferences/interpretations
Implications/consequences
Point of view

Within Paul's model, these Elements are deemed to constitute the minimum necessary concepts to understand or analyse the 'logic' or the 'central intellectual and epistemological concerns' (Moore, 2011b, p.33) of any discipline,

> *'When you are reasoning, you are trying to accomplish some purpose, within a point of view, using concepts or ideas. You are focused on some question, issue or problem, using information to come to a conclusion based on assumptions all of which have implications'*

(Paul & Elder, 2006, p.57).

The Elements are generic in the sense of the language and concepts used but when applied to a context (a discipline) Paul argues it enables the nature of that discipline to be 'surfaced' (Paul, 2005; Hale, 2008) or what McPeck (1990, p.33) might call laying bare the 'epistemic foundations' of the subject. For example, the generic concept of 'concepts' when applied to a specific disciplinary context is said to uncover and make explicit central organising or classifying ideas within that discipline (Nosich, 2008) or, as has been described elsewhere, providing 'conceptual gateways or "portals" to be passed through… to arrive at important new understanding' within a disciplinary context (Land, Meyer & Smith, 2008, p.x).

ii) The Intellectual Standards.
These include:
Clarity
Precision
Accuracy
Logic
Significance
Relevance
Depth
Breadth
Fairness

These are presupposed to be criteria applicable to assess the quality of thinking in any context (Paul & Elder, 2006). However, it is assumed that these take on a distinctive identity within a disciplinary context whereby 'precision' in mathematics would not be understood in the same way as 'precision' in art, for example. This would align with the contextualised nature of standards for Critical Thinking presented by Bailin et al (1999b) above.

iii) The Intellectual Traits.
These include, amongst others:
Intellectual autonomy
Intellectual curiosity
Intellectual perseverance
Intellectual humility

These are not disciplinary specific, focusing on the dispositions or attributes of a 'Critical Think*er*', as distinct from the features of Critical Think*ing*, to be fostered in students to support their 'integration' into the academic world of any discipline (Hale, 2008). These illustrate the role of dispositions or virtues identified in the normative conceptualisation of Critical Thinking referred to above (Bailin et al, 1999b; Lipman, 2003, Winch, 2006) and could be said to be much more abstract in pedagogical terms compared to the Elements and the Standards.

The model is deemed to be distinctively 'trans-disciplinary' in that it claims to straddle both the generic and subject specific approaches. In other words, the model does not belong to one discipline, but the context or the discipline defines the problem, issue or question to be analysed. It is a model, therefore, that claims to work within and across disciplines (Hale, 2008) and, as such, suggests it could possess the 'generalizable powers' Bonnet (1995) was in search of. However, it is such claims for practice that are examined as part of this particular research by looking closely at what is happening within and across disciplines where teachers are implementing their understanding of a Critical Thinking based approach drawing on Paul's model in the context of their A level teaching.

To conclude this section, I have focused internally on the field of Critical Thinking and have given a brief overview of four conceptualisations of Critical Thinking relevant to this study which consists of: Critical Thinking as argument; a normative conceptualisation of Critical Thinking, emphasising the role of wider skills alongside standards and dispositions; and Critical Thinking as being disciplinary specific. This led to an examination of Paul's trans-disciplinary model of Critical Thinking as offering possible answers to the pedagogical questions raised by the previous three perspectives. However, what is evident, even from this selective overview, is that there is no single concept of Critical Thinking. Indeed, the multifaceted dimension of Critical Thinking explored here will be elaborated upon further in section two where I examine the apparent overlap between Critical Thinking and other pedagogical conventions; and in which a key distinction emerges between Critical Thinking as process and Critical Thinking as outcome.

2.1.2 Theoretical Links between Pedagogic Conventions and Critical Thinking

In terms of the approaches teachers adopt in the classroom, Moore's (2011b, p.14) call for the 'pedagogical means by which the concept of Critical Thinking can be made articulate to students' suggests a shift in mind set from Critical Thinking as a programme that is taught, to Critical Thinking as a way of teaching (Hare, 1995, Flores et al, 2010). In this way, Moore points to two of the pedagogical issues referred to in the Introduction (see p.10 above) in terms of the practical application in educational contexts of Critical Thinking models; and of the distinction between Critical Thinking as outcomes and Critical Thinking as an approach to teaching which would foster such outcomes. In this context I give an overview of three specific pedagogical conventions which the literature suggests could be associated with a

practical enactment of Critical Thinking in the classroom. These consist of: Bloom's taxonomy; socio-constructivist approaches to teaching and learning; and metacognition.

2.1.2.1 Critical Thinking and Bloom's Taxonomy

Whilst it is not the purpose of this thesis to present a comprehensive review or critique of Bloom's taxonomy, it is appropriate to include a carefully framed reference within the context of Critical Thinking, given that parallels are drawn in the literature between Critical Thinking and what Bloom (1956) has described in his Taxonomy of Educational Objectives as higher order thinking skills of analysis, evaluation and synthesis (see table 2. 1 below). Furthermore, notwithstanding its flaws, it is a model which still features significantly in teachers' pedagogical repertoires, as will be illustrated notably in chapter five. Indeed, several Critical Thinking theorists view Blooms taxonomy as a helpful starting point when discussing Critical Thinking (Sternberg, 1986; Facione, 1990; Paul & Scriven in Huitt, 1990; Ennis, 1993; Halpern, 1998; Moselely et al, 2005). Indeed, Paul (1985, p.37), in his critique of Bloom's taxonomy in relation to Critical Thinking instruction, acknowledges the relationship between the three higher order processes and Critical Thinking,

> *'Sections on analysis, synthesis and evaluation…disclose that most processes characterised as essential to higher order questions in fact presuppose use of the basic concepts of Critical Thinking: assumptions, fact, concept, value, conclusion, premise, evidence, relevant, consistent, implication, fallacy, argument, hypothesis…'*

Indeed, Paul's view that Critical Thinking comprised a range of cognitive processes characterised as higher order skills is endorsed in the revision of Bloom's taxonomy (Anderson, Krathwhol, Airan, Cruikshank, Mayer, Pintrich, Raths & Wittrock, 2001). However, in his critique, Paul goes beyond identifying a correlation between higher order skills and Critical Thinking by spelling out the implications for teaching. In other words, if higher order skills require students to be adept in understanding and applying what Paul termed above the 'basic concepts of Critical Thinking', then teaching should be such that they are an explicit feature of the content and language of instruction. Indeed, the data chapters (chs. 4-6) will show how the language of analysis, synthesis and evaluation features heavily in A level specifications to articulate the *outcomes* required for higher level performance, and how such language is imbued in teachers' understanding of Critical Thinking. However, it is beyond the remit of this thesis to ascertain the extent to which these terms are deemed to have a shared meaning across the three contexts of the A level

specifications, Critical Thinking, and teacher usage. What is pertinent to this study is to explore the meanings teachers attribute to these terms and how such understanding is played out in their rendering of Critical Thinking in the context of their A level teaching, which will be evident in the data chapters (chs. 4-6).

	COGNITIVE PROCESS HIERARCHY	
HIGHER ORDER THINKING	↑	EVALUATION
		SYNTHESIS
		ANALYSIS
LOWER ORDER THINKING	↑	APPLICATION
		COMPREHENSION
		KNOWLEDGE

Table 2.1 A representation of Bloom's taxonomy based on Bloom (1956)

Nevertheless, if there is some agreement on the overlap between higher order skills and Critical Thinking, a key criticism of Bloom's taxonomy raised from different quarters of the Critical Thinking field is that related to the status attributed to 'knowledge' and the so -called lower order skill of 'comprehension'. McPeck (1990, p.45) bemoans the 'relegation' of factual knowledge within the field of education,

> *' We have not taken the time to understand or appreciate what is conceptually involved in factual "knowledge", nor how far it takes one forward in the goal of autonomous thought'.*

Paul (1985) also challenges what he perceives as the restricted and reductionist conceptualisation of 'knowledge' and the one directional hierarchy between the cognitive process categories. Paul is critical of Bloom presenting knowledge as a fixed body of factual information 'currently known or accepted by experts in the field' (quoted in Paul, 1985, p.38) to be 'recalled' as such a body of information. Within the context of the hierarchy, Paul questions why comprehension appears to presuppose knowledge, but that knowledge does not presuppose comprehension. Indeed, Paul would describe this form of 'detached' knowledge as 'inert knowledge' which is described as 'taking into the mind information that, though memorised, we do not understand' (Paul & Elder, 2006, p.68). Paul appears to align

with McPeck and argues that 'knowing' something entails a much more complex process than implied by Bloom's taxonomy,

> *'Knowledge, rightly understood, is viewed as a distinctive construction by the learner, something that issues out of a rational use of mental processes' [and therefore] 'knowledge, in any defensible sense is an* ***achievement*** *requiring a mind that is slow rather than quick to believe'* (emphasis in the original).

In fact, he appears to reverse to some extent the original hierarchy when claiming 'the achievement of any knowledge always presupposes at least minimal comprehension, application, analysis, synthesis and evaluation.' (Paul,1985, p.39). As a result, it would seem, from this perspective, that knowledge creation leading to authentic understanding on the part of the student is itself seen to be a Critical Thinking process, which is a position supported by others in the field (Pithers & Sodden, 2000; Halpern, 2003). Paul describes this more 'dynamic' concept of knowledge as 'activated knowledge' (Paul & Elder, 2006) that students 'own' and can manipulate, adapt and apply. This appears to raise a fundamental and philosophical difference in terms of the nature of 'knowledge': what it is and how it is acquired. It would appear that 'knowledge' from this Critical Thinking perspective would dovetail with socio-constructivist theories of education, which will now be explored.

2.1.2.2 Critical Thinking and Socio-Constructivist Perspectives on Teaching and Learning

Socio-constructivist theory itself is a vast and contested field that goes beyond the scope of this thesis. However, for the purpose of this study I am using the term as outlined by Mercer (2000) and Moll (2014) derived from the work of Vygotsky whereby language is seen as having a dual function: a means by which individuals formulate ideas; and also as a cultural tool for sharing and jointly developing knowledge. Indeed, suggestions of pedagogical practices put forward in the Critical Thinking literature appear to align with this socio-constructivist perspective: notably in terms of emphasising the role of student questioning and discussion; and by the teacher adopting a facilitative style rather than a didactic approach (Le Cornu, Peters & Collins, 2003). These will now be examined in further detail. In relation to discussion and student questioning, many Critical Thinking theorists embrace the value of a dialogical or discursive approach to teaching for Critical Thinking (Ennis, 1987; Siegel ,1988; McPeck,1990; Paul, Binker, Martin & Adamson, 1995; Bailin et al, 1999a; 1999b; Lipman, 2003). As Thayer- Bacon (2000, p.134) outlines, 'a dialogical style of teaching encourages students to develop logical reasoning' by providing the opportunity for

ideas to be examined in depth. Meyers (1986) argues that Critical Thinking skills develop best in an atmosphere of dialogue, interchange, questioning and problem solving where time is given to students for 'quiet pondering…to mull over and digest all the new information, concepts and methodologies being presented to them' (Meyers, 1986, p.63). What is being advocated here is what was referred to above as 'activated knowledge', in other words, knowledge that is not merely regurgitated but which is fully appropriated by the students which they can draw on fluently and flexibly, which is 'theirs'. The role of discussion in this context is clarified by Dillon (1994, p.33) whereby the criterion for a purposeful topic for discussion is 'if it is *something in question for students'* (author's original emphases). As has been pointed out (Alexander, 2008; Osborne, 2010; Claassen & Osborne, 2013), even though the subject matter may be uncontested propositional content, it can still be a fruitful focus for discussion and student questioning if students have not securely understood such content.

Such an approach to teaching clearly has implications for the role of the teacher in terms of orchestrating tasks and activities which encourage such interaction. Indeed, Raths et al (referred to in Pithers and Soden, 2000) take further what is inherent in the approaches referred to above, by identifying the primacy of teacher-student interaction as the locale where Critical Thinking can best be promoted. This appears to have been supported by more recent studies into teacher practices which foster Critical Thinking (Sale, 2007; Miri, David & Uri, 2007; Li Li, 2011). In this context, a lesson is seen as 'a series of complex and inter-related micro contexts' (Li Li, 2011, p.148) where the responsibility for establishing and shaping interaction is with the teacher, taking on the role of 'expert' within a Vygotskian perspective, inducting the 'novice' historian, mathematician, or linguist through scaffolded interactions. This might be done, for example, by probing for depth and breadth; by asking for clarification, evidence and seeking assumptions (Meyers, 1986; Dillon, 1994; Bailin et al, 1999b; Miri et al, 2007); or by focussing on supporting students' conceptual understanding and their application of conceptual abstractions in a meaningful context (Meyers, 1986; Langer, in Pithers and Solden, 2000; Nosich, 2008; Land et al, 2008). Example of such interactions will be examined in the data chapters (chs.4-6).

To summarise, Critical Thinking as a way of teaching seems to have parallels with socio-constructivist perspectives on teaching and learning. In other words, learning to think critically appears to be an inherent social process embodied in discussion and student

centred activities (Len Dam & Volman, 2004). The role of the teacher, from this perspective, is that of facilitator and orchestrator of such processes Therefore, in this context, Critical Thinking is not necessarily explicitly taught but nurtured through cultural practices within the classroom (Moon, 2008). The third and final dimension to a Critical Thinking based approach to pedagogy to be examined is metacognition.

2.1.2.3 Critical Thinking and Metacognition

As with Critical Thinking, there is considerable debate about the definition of metacognition in the research literature (Moseley et al, 2005). The term is usually attributed to Flavell (1976, p.232),

> 'Metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of the processes…usually in the service of some concrete goal or objective.'

As already explored in this chapter, there exist varied definitions of Critical Thinking, but there is a strong consensus across the research literature that Critical Thinking involves metacognitive components (see Halpern, 1997; Pithers & Soden, 2000; Tsai, 2001; Dean & Kuhn, 2003; Lipman, 2003; Swartz, 2003; Black, 2005). Indeed, Dean & Kuhn (2003) propose that metacognition could be the means through which the outcome/process dichotomy might be addressed whereby metacognition serves as a bridge between Critical Thinking as a desired objective of education, on one hand, and the concerns of educators as to how this is to be achieved, on the other. In other words, they distinguish explicitly between Critical Thinking as 'outcome' and the pedagogical processes that they see as essentially metacognitive, which support the outcome. What this might translate into in terms of classroom practices is outlined by Halpern, (1998, p.454),

> *'When engaging in Critical Thinking, students need to monitor their thinking process, checking whether progress is being made towards an appropriate goal (and) ensuring accuracy…Metacognitive monitoring skills need to be made explicit and public so that they can be examined.'*

Paul's Critical Thinking model, as outlined in section one above, appears to embody what could be called a synthesis of Critical Thinking and metacognition in that Paul does not appear to distinguish between the two: his conceptualisation of Critical Thinking is essentially a metacognitive one,

> *' Critical Thinking is that mode of thinking – about any subject, content or problem- in which the thinker improves the quality of his or her thinking by skilfully analysing, assessing and reconstructing it. Critical Thinking is self-directed, self-disciplined, self-monitored and self - corrective thinking. ' (Paul & Elder, 2006, p.xxiii)*

What his model claims to offer are particular 'tools' for explicitly analysing or evaluating the quality of thinking, through the Elements of Thought and Intellectual Standards (see above, p.25). Furthermore, such tools also provide a form of meta-language with which to talk about the language of thinking and learning. How this feature of Critical Thinking is played out in the context of the A level classroom is examined in the case studies in chapters four, five and six.

An additional dimension to metacognition from a pedagogical and Critical Thinking perspective is its role in relation to supporting student autonomy. In other words, if teachers orchestrate learning such that students adopt the habit of questioning and monitoring their own thinking and learning, then that suggests students taking a degree of ownership or agency over their learning (Swartz, 2003; Moseley et al, 2005). As Thomas (2003, p.181) found in his study of metacognition in science classrooms, 'a key objective of developing students' metacognition is to develop them as autonomous, self-regulated learners.' Whilst this may not meet the normative ideals of the Intellectual Traits or 'Virtues' referred to earlier in this chapter, it may indicate a means by which what I would more realistically call 'critical qualities' could feasibly be inculcated in the context of the classroom.

To summarise, in this section, I have explored links between Critical Thinking and other conventions held within the wider pedagogical field of specific relevance to the practice presented in this thesis, notably Bloom's taxonomy; socio-constructivist approaches; and metacognition. Bloom's Taxonomy appears to provide a language with which to examine what might be considered Critical Thinking outcomes, in terms of analysis, synthesis and evaluation, although Paul and McPeck would argue that knowledge as they define it is also a Critical Thinking outcome. Socio-constructivist approaches and metacognition appear to illuminate the pedagogical means by which such outcomes might be achieved and may indicate a means through which features of what I term 'critical qualities' could also be promoted in a classroom context.

I end this section by explaining how I will proceed pragmatically in this thesis to discriminate between the two dimensions of Critical Thinking as outcome and process. In order to distinguish between the two in the ensuing data and discussion chapters (chs.4-7), I have developed the heuristic CT/ct to clarify when I am referring to critical thinking outcomes (ct) and Critical Thinking pedagogical approaches (CT) to support such outcomes. In the context of this study, critical thinking outcomes will be predominantly defined by the A level

specifications. How these are manifested in terms of the subjects featured in this study will be presented in the data chapters. Critical Thinking pedagogic strategies will be those deployed by the teacher to support students' progression towards producing these outcomes.

2.1.3 Conclusion to Part One

The research literature is rich with philosophical analyses and conceptual models of Critical Thinking, a selection of which I examined in section one above where Critical Thinking was presented in terms of argument; a normative concept; as disciplinary specific; and as a trans-disciplinary concept. As such, this may have reinforced two issues deemed to be affecting the uptake of Critical Thinking in the classroom identified in chapter one, notably the diversity of views over what actually constitutes Critical Thinking; and a lack of clarity over how such theoretical models of Critical Thinking transfer into practical applications in the classroom.

However, in the second section, I examined three specific pedagogic conventions from the field of education: Bloom's taxonomy, metacognition and socio-constructivist theories of learning where it was possible to identify some theoretical alignment with either critical thinking outcomes, as in the case of Bloom's taxonomy, or Critical Thinking processes to support such outcomes, as in the case of metacognition and socio-constructivist approaches. What seems to emerge from this initial examination of the literature, therefore is a suggestion that Critical Thinking in the context of pedagogical practice may be a complex, multi-faceted dynamic which defies a 'fixed' position or definition. The purpose of this research, therefore, is to go beyond theoretical perspectives to examine at close quarters three teachers' interpretation and enactment of Critical Thinking as articulated in Paul's trans-disciplinary model. The complexity of what this process might entail is the focus for the second part of this chapter.

2.2 The Transfer of Critical Thinking Theory into Pedagogical Practice.

The three teachers participating in this research had all engaged with a professional development programme on Paul's trans-disciplinary model of Critical Thinking (see appendix A) and, as will be explored more fully in the methodology chapter (ch.3), all three had self-identified as applying the model to their A level teaching. The professional development programme itself is not a feature of this research, rather it is *how* teachers had interpreted it and translated it into their teaching which constitutes the focus of the thesis. This second part of the chapter, therefore, examines the literature pertaining to the so-called 'transfer' of theoretical models by teachers to their classroom practice. This is divided into two sections: section one explores the influences brought to bear on such a 'transfer' by three inter-related factors of the individual context, the institutional context, and the influence of wider policy. Section two develops issues raised in section one from the perspective of Bernstein's (2000) concepts of strong/weak subject classification and associated visible and invisible pedagogies. As a result, the work conducted by the teachers featured in this thesis is located within the wider fields of practitioner learning and pedagogical development, and is based on Eraut's (1994; 1998) constructivist conceptualisation of teacher professionalism.

2.2.1 Contextualised Practice

In this section, I examine the role of context and the influences it exerts on teachers engaging with pedagogical change. This is divided into three areas: firstly, that of the individual teacher engaged in a process of constructing and enacting his or her own understanding of a theoretical pedagogical model in their own classrooms. In this regard, I make reference to Eraut's (1992; 1994; 1998) concepts of public and personal propositional knowledge and practical personal use; Leung's (2013) concept of independent professionalism; and Shulman's (1986) pedagogic content knowledge (PCK). Secondly, I refer briefly to the influence of the local or institutional context in which the teacher works. Finally, I examine issues from the perspective of the influence of national policy (Hodkinson & Hodkinson, 2005; Yee Fan Tang & Lin Choi, 2009). For the purpose of clarity, these are presented under separate headings, whilst recognizing that that these headings constitute an artificial divide and in reality all three are simultaneously active and function as a symbiotic dynamic.

2.2.1.1 The Individual Context

Eraut (1992; 1994; 1998) identifies the complexity involved in what may superficially be seen as teachers 'applying' theoretical models or findings from research into their pedagogical practice. He distinguishes between public propositional knowledge and personal propositional knowledge, and the transfer of personal propositional knowledge to 'action' or 'practical personal use' (Eraut, 1994). According to Eraut, such processes of 'transfer' are dependent on two factors: firstly, on the opportunity to use or develop the new 'idea' in context; secondly, on the personal knowledge, understanding, experience and intuition brought by each individual, which has also been termed as 'personal theory' (O'Hanlon, 1993). In fact, for Eraut (1994), the context of use and use itself cannot be separated. Discounting a linear relationship between learning and 'application' and adopting a constructivist view, he argues that learning takes place during the use and transformation of knowledge, and that knowledge itself, through the context of its use, assumes a 'situationally appropriate form' (1994, p.20). What is implied here is that the teacher's resulting new practical knowledge may be different from the 'original' public propositional knowledge, or, as Eraut (1994, p.25) puts it,

> *'the process of using knowledge transforms that knowledge so that it is no longer the same knowledge'*.

In addition to new knowledge being shaped by the context of use, it will also be shaped by personal knowledge or 'personal theories' (O'Hanlon, 1993), in other words by 'what individuals bring to situations to enable them to think, interact and perform' (Eraut, 2008, p. 42). This, by definition, will vary from individual to individual ensuring that with the same theoretical stimulus or input, the resulting knowledge and pedagogical practices will differ across teachers. Elliott (1993, p.69) adds a further dimension, that of teachers' 'perceived relevance' of the theoretical knowledge where theories 'are selected and utilised eclectically in terms of their perceived relevance for discerning and discriminating the practically significant features of the situation.'

Indeed, in the context of this research, Paul's trans-disciplinary model of Critical Thinking, as outlined in the first part of this chapter, constitutes public propositional knowledge codified in a set of materials and publications (see appendix A). However, as will be shown in the data chapters (chs.4-6), how teachers made sense of them from the perspectives of their own contexts and personal knowledge and, therefore, how Critical Thinking was construed and

manifested through practice, would vary. Their interpretations and use of aspects of Critical Thinking may constitute new knowledge different to or modified from the 'codified' model given that 'the interpretive use of an idea in a new context is itself a minor act of knowledge creation' (Eraut, 1994, p.54).

To illuminate this further, I draw on the concepts of 'interpretation' and 'translation' as presented by Ball et al(2012, p.3) in relation to policy enactment,

> *' ...policy enactment involves creative processes of interpretation and recontextualisation –that is the translation of texts into action and the abstractions of policy ideas into contextualised practices….'*

Whilst Ball et al (2012) are applying this heuristic to research into whole school enactment of national educational policies, I would argue that the principles still apply in terms of both A level specifications and Paul's Critical Thinking model. The A level specifications as a form of policy text constitute a general articulation of the requirements of the course framed mainly in terms of expected outcomes, as will be examined in more detail in the data chapters (chs.4-6). Similarly, Paul's Critical Thinking model 'exists' in terms of an abstract trans-disciplinary framework as presented in the materials produced by the Critical Thinking Foundation (see the appendix A). In both cases the teacher needs to interpret the texts which, according to Ball et al (2012), consists of the teacher making sense of the texts for him or herself, and working out what he/she needs to do. 'Translation' is the processes involved in transforming that interpretation into specific action. In the case of both the A level specifications and the Critical Thinking framework, Ball et al's (2012, p. 3) rallying cry appears to apply,

> *' These texts cannot simply be i**mplemented**! They have to be translated from text to action- put 'into' practice –in relation to history and to context, with the resources available'* (authors' emphasis).

Indeed, what was clear from the first part of this chapter is that no fixed model or conceptualisation of Critical Thinking exists. Moon (2008) takes this further and applies a constructivist approach to Critical Thinking itself, and advocates the development of local definitions that apply to a local situation between teachers and learners. Indeed, this is what is explored in the case studies presented in chapters four, five and six: in effect three local definitions enacted within specific contexts. As such, it could be argued that these teachers are themselves contributing their own constructs of Critical Thinking to the wider field or, indeed, 'engaged in minor acts of knowledge creation' (Eraut, 1994).

It would be possible to conclude, therefore, that to engage in the theory-practice dialectic which emerges from this constructivist perspective requires considerable intellectual effort on behalf of the teacher (Elliot, 1993; Eraut, 1994; Cochran & Lytle, 2009),

> *' By making the twin assumption that all theory is non-practical and all practice is non-theoretical, this approach always underestimates the extent to which those engaged in educational practice have to reflect upon and hence theorize what, in general, they are trying to do'* (McEwen, quoted in Cochran & Lytle, 2009, p. 134).

Indeed, Leung (2013, p.24) identifies a commitment on the part of teachers to such reflection on their own work and to effect change as appropriate as an essential part of what he terms 'independent professionalism'. Furthermore, Leung (2013) makes a direct connection between such professionalism and its manifestation at the local level of classroom interaction with reference to the final aspect of individual context to be examined here: Shulman's (1986) concept of pedagogic content knowledge (PCK).

PCK examines the relationship between disciplinary knowledge and pedagogical knowledge, and how teachers mediate such a relationship. In other words, PCK provides a frame for examining the classroom practices by which a teacher transforms his/her understanding of subject content to make it 'teachable' and accessible to students. Such knowledge might consist of ways of representing and formulating the subject so it is comprehensible to others. It would also include an understanding of the difficulties posed by a particular topic; and an understanding of students' pre-conceptions or misconception and how they might best be addressed. Context from a PCK perspective is therefore characterised in highly specific terms by an individual teacher's subject, or a particular topic within a subject; the nature of his/her students' understanding or barriers to understanding; and the 'personal theories' (O'Hanlon, 1993) that a teacher may bring to the learning context in terms of their own rationale for the pedagogical decisions they make (Gudmundsdottir & Shulman,1987). PCK, therefore, is a further highly individual and situational form of knowledge which, in the context of this study, may inform teachers' decisions in relation to their use of Paul's Critical Thinking model.

To summarise, this segment of the chapter has explored a view of teacher professionalism which positions the teacher as an active agent in the construction of his/her interpretation and enactment of educational models, which in this study takes the form of Paul's Critical Thinking model. Such processes are informed, amongst others, by the context of use; personal theories individual teachers hold; the perceived relevance of a particular theory or

model; an understanding of the nature of the subject taught along with an understanding of the difficulties such content may pose individual cohorts of students. From a constructivist view, this places the teacher at the interface between theory and practice, challenging the rather technicist view of teacher professionalism that assumes that pedagogical models or tools are merely 'implemented' (Cochrane-Smith & Lytle, 2009).

The extent to which teachers featured in this study are involved in the complex intellectual process referred to in this section will be made clear from the data chapters (chs.4-6) to follow. However, such action in the classroom also takes place within a wider educational landscape, and the influences of wider institutional and national policy perspectives at play in the context of the classroom will now be examined.

2.2.1.2 The Institutional Context

The institutional context can more widely be considered to include, amongst others, the classroom, the department, colleagues, exam requirements, as well as the school, or organisations of which the school is a part, such as the Local Authority or a Multi Academy Trust in the current national landscape. These provide a cultural and structural context which forms the working conditions for teachers, which, in turn, mediate individual teachers' professional learning (Kelchtermans, 2004). The relationship between teachers and context is one of 'interaction' or a dynamic through which teachers make sense of their learning and professional experiences (Day & Sachs, 2004). A key factor here could be the institutional context acting as a filter in terms of professional development, 'privileging some learning activities whilst limiting others' (Kelchtermans, 2004, p.226) which teachers, in turn, recognise as being of greater value or status than others.

The role of the immediate context in supporting teachers' professional learning is crucial if, as has been outlined above, teacher use is key to the development of new pedagogical approaches. Such development is facilitated by practices including collaboration with peers, feedback, opportunities for reflection and discussion within a culture where there is 'permission' to experiment and take risks (Bolam & McMahon, 2004; Cordingley & Bell, 2007; Cordingley, 2009). Therefore teachers' departmental and school context may have a role in understanding teachers' engagement with the Critical Thinking programme featured in this study. A workable perspective in the context of this study will be discerning school culture through what it permits in policy and practice. This may be inferred from interview

data with participant teachers and from classroom practices observed in lessons, and is further elaborated upon in the methodology chapter (ch.3).However, it is impossible to distinguish influences at an institutional level on departments and teachers from those exerted through national policy. The three appear to be dynamically entwined and, as such, the influence of the wider national policy context will now be examined.

2.2.1.3 The National Context

The 'tectonic shift' (Gerwitz, Mahoney, Hextall & Gibb, 2009, p.6) that has taken place over the last thirty years to a neoliberal ideology permeating all aspects of public services in general, and education in particular, is well documented (see for example Ranson, 2003:Day & Sachs, 2004; Kelchtermans, 2004; Ball, 2008; Gerwitz et al, 2009; Lingard & Renshaw, 2010; Blackmore, 2010; Ball et al, 2012). The implication for education is that policy has been rearticulated in terms of needing to produce requisite human capital for a globalised economy (Lingard & Renshaw, 2010) with students equipped with competencies in key skills, especially literacy and numeracy (Ball et al, 2012). Consequently, education has been structured around three 'mechanisms' of the market, managerialism and 'performativity' (Ball, 2008). Schools and teachers in England since 1988 and the inception of the National Curriculum have learnt to adapt to an educational environment where teaching and the curriculum conform to national policy guidelines, open to market pressures in terms of 'parental choice' and held accountable through league tables and inspections (Day & Gu, 2010) where the 'rules' for accountability have been regularly altered by successive governments. For example, September 2015 saw the fourth inspection framework implemented in England since 2009 with a separate judgement on Sixth Form provision, including national minimum standards for outcomes at this level.

Such a policy context, where work in schools, including that at Sixth Form, is heavily scrutinised and evaluated against quantitative targets based on students' performance in particular tests is deemed to have, therefore, an impact on schools and teachers. Indeed, operating in a high stakes accountability and assessment system was one of the issues identified in the Introduction (p.10 above) believed to be hindering the uptake of Critical Thinking in classrooms. The impact of such a policy context on teaching and learning appears to have been to 'thin out' pedagogies (Lingard, 2009, p.81) leading to a technicised and reductive pedagogy as illustrated by Torrance's (2008) study into teachers' use of

assessment for learning practices being translated into instrumentalist exam preparation practices which appears to have had a corresponding impact of removing challenge and opportunities to develop student autonomy. Similarly, Lingard (2007; 2009) found in his longitudinal study in Australia into Queensland School Reform a narrowing of the curriculum due to the high stakes testing regime, leading to a 'shaving off of higher order and Critical Thinking and a lowering of cognitive demand and intellectual depth' (Lingard, 2009, p.88). Such a consequence constituted what Lingard calls a 'pedagogy of indifference' (Lingard, 2007, p.247) in which students are denied 'the achievement of higher order goals and the disadvantaged access to the capitals [knowledge, skills and dispositions] necessary for high level performance and active citizenship' (Lingard, 2007, p.256). As Hartley identified in 2003 (p.90), 'the raising of standards has gone hand in hand with the standardisation of the means and ends of education' which has not ceased over the ensuing years. The implications of such policy are elaborated upon further below from the Bernsteinian perspective of strong disciplinary classification and associated pedagogies.

However, such a discourse risks presenting teachers as passive recipients and 'deliverers' of policy (Cribb, 2009), who lack any meaningful sense of agency over their professional context. Indeed, as Ball et al (2012) indicated above, there is still a need for interpretation and translation which implies some 'space' for agency. Indeed, the implications for professionalism seem to have been embodied in a series of contrasting and competing professional identities such as 'organisational professionalism' which develops from what is imposed 'from above' in terms of frameworks of standards and accountability, with 'occupational professionalism' or 'independent professionalism' based on autonomy and confidence in practitioners' use of discretional judgment (Evetts, 2009; Leung, 2013). Such representations are more likely to constitute a series of continua with an individual moving their position at any one time, rather than presenting fixed single identities, although, as has been suggested above, the policy context may support or favour one end of the continuum over another. What such continua may help to clarify is that whilst the current embedded policy context appears to be promoting 'thinning' and reductionist pedagogies, this may be occurring within the context of teachers facing genuine dilemmas divided between their own professional and pedagogical values and more pragmatic or instrumentalist approaches in the face of the perfomativity culture (Cribbs, 2009; Ball et al, 2012).

Such tensions are of direct relevance in the context of developing a Critical Thinking based pedagogy where the literature appears to indicate a link between a commitment to such an approach to teaching and teacher values,

> ' *How teachers make sense of their disciplines, the issues and problems they choose to focus on, and the questions they use to address these concerns are all intimately related to personal values, interests and commitments*.' (Meyers, 1986, p.90)

The Critical Thinking programme as enacted by teachers in this study appears to be both a product of, and contributor to, the current context of competing pedagogic practices. The rationale for the programme, as referred to in the Introduction (ch.1), was to support the development of pedagogy to promote greater student autonomy, deeper intellectual engagement with their discipline and associated academic discourse in order to support improved outcomes in the A level examinations. However, this is happening within a context where more reductionist practices may be favoured and supported. Paradoxically, the adoption of the Critical Thinking programme in this school may be viewed as an acknowledgement that such reductionist practices, which may have 'delivered' outcomes required at GCSE, may not be appropriate for A level students aiming for the highest grades. How such tensions play out in the context of the classrooms in this study will be examined in the data chapters (chs. 4-6).

To summarise, although this section has looked separately at issues around professional practice from the perspective of the individual, the institution and wider national policy, all three are part of a complex relational dynamic. However, it may be fair to say that the relationship is not one of equal partners and, as has been suggested, the current policy context may serve to validate certain forms of knowledge, curriculum and pedagogy over others. However, the context in which Critical Thinking was introduced into the school featured in this study points to a paradox, where an attempt to improve exam performance at A level has been met with a pedagogical approach seemingly at odds with the technicist and reductionist pedagogies traditionally associated with a focus on exam outcomes (Torrance, 2008; Lingard, 2009). It is at this juncture that I introduce in the final section of this chapter Bernstein's concepts of visible/invisible pedagogy and strong/weak disciplinary classification to help explore what appears to be happening with Critical Thinking in the contexts of the classrooms featured in this study.

2.2.2 Bernsteinian Conceptual Frames

Given the primary focus of this study is a close and detailed encounter with three teachers pedagogical practices in relation to Critical Thinking and their A level teaching, I draw on specific conceptual perspectives derived from what Bernstein describes as the 'micro-level' of classroom practice as opposed to the 'macro-level' of grand theory (Bernstein, 2000). As will be shown more extensively in chapter seven, I use Bernstein's specific concepts of strong/weak classification and associated visible/ invisible pedagogies as a heuristic within which to explore teachers' pedagogical practices within the locale of their classrooms. The purpose of this final section of the chapter is, therefore, not to present an overview Bernstein's body of work in relation to education, but to provide a short summary of the specific concepts of strong/weak classification and visible/invisible pedagogy in relation to the purpose and context of this study.

Bernstein (2000) makes the distinction between strongly defined disciplines, such as physics, history, biology, and those more weakly defined, such as media studies, which draw on a range of other fields. In terms of strong classification, each category or discipline has its unique identity, its own voice, and its own specialised rules. In other words, to draw on the terminology deployed in an earlier part of this of this chapter, it has its own distinct disciplinary discourse (see p. 23 above). In terms of Sixth Form education, strong classification is manifested through the organisation of the curriculum into distinct subjects for which specific departments are responsible for teaching and to which individual teachers are tied. Strong classification is further embodied and reinforced through the official resources within the field. These include each subject's A level specifications as accredited by Ofqual (the regulator of qualifications, exams and tests in England), exam boards, and publishers of A level textbooks, often related directly to specific exam boards and their A level specifications. At the start of this research, A levels already existed in the context of strong subject classification. However, during the period of curriculum change in which this research took place, strong classification has been further reinforced through national policy with changes to the National Curriculum for 11-16 year old students and to A level specifications. These changes have been framed in terms of subject specific 'powerful knowledge' where 'the concepts, facts, processes, language, narratives and conventions of each subject constitute socially refined forms of knowledge' (DfE, 2011). A level reform in particular has been based on 'reviewed and updated content' with universities, seen as the

gatekeepers of disciplinary integrity, playing a greater role in informing the development of the qualifications (Ofqual, 2014).

Bernstein (2000) suggests that within a curriculum based on strong classification, progression will be from concrete, local knowledge to mastery of simple operations, moving to more abstract principles in the later stages of schooling. It is precisely this transition from what has been characterised as a general education at GCSE to an academic one at A level (Andrews & Mitchell, 2001) with the challenge of securing an authentic mastery of a more complex body of knowledge, including greater conceptual understanding, which emerges as a key issue for the teachers in this study, as will be seen in the data chapters (chs.4-6). Within such a context where strong subject classification dominates, the implications for pedagogy manifest themselves in what Bernstein (1990; 2000) characterises as a 'performance model'. In other words, there is a focus on 'output', what students can produce, in relation to the particular 'pedagogic texts' students are required to construct, and the specific skills necessary to lead to the production of this 'output'. The case studies (chs.4-6) reveal that this is very much the preoccupation of all three teachers, with a clear focus on the 'pedagogic texts' required by the A level exams, and show how teachers appeared to draw on aspects of the Critical Thinking model to support this. Bernstein connects performance models and strong classification in what he labels 'visible pedagogy'. In this form of pedagogical practice, often characterised as 'traditional' or 'conservative', the authority and control of the teacher is evident through explicit classroom control and a focus on performance, with learners having little control over selection, sequence and pace of the lesson (Bernstein, 2000). In such lessons, according to Bernstein, pedagogic spaces and specific pedagogic practices are clearly marked; the sequencing and pace of learning activities are controlled by the teacher and explicitly communicated; and there is a focus on 'deficit', in other words 'what's missing' from the performance of students in relation to set and shared criteria. The limits and constraints on classroom pedagogy imposed by a such a context is made clear by Bernstein (2000, p.49),

> *' Any particular pedagogical practice and the acquirer's [student's] performance is subordinate to external curriculum regulation of the selection, sequence, pacing and criteria of the transmission.'*

This contrasts with 'invisible pedagogy', characterised by: implicit teacher control over the learner; reduced emphasis on the transmission or acquisition of specific skills or knowledge with an emphasis on 'ways of knowing'; relatively free activity by the learner, in other words a

greater degree of autonomy and self-direction; and the use of different and wide ranging criteria to evaluate learning (Bernstein, 1975). In contrast to the 'performance model', there is a greater focus on developing 'competence', where competences are understood as 'the procedures for engaging with and constructing the world' (Bernstein, 2000, p.42). Such a pedagogy might align with what emerged from the metacognitive and socio-constructive features of a Critical Thinking pedagogy examined in the first part of this chapter. Indeed, in the context of the critical thinking outcomes/Critical Thinking pedagogical process construct and terminology already deployed in this thesis, it might be possible to make a tentative alignment between 'performance' with outcomes and 'competence' with the processes to support such outcomes.

However, as will be illustrated in the data chapters (chs.4-6), the link between competence (process) and performance (outcomes) does not always appear to be so distinct in the context of the teaching featured in this study. As Alexander (2008) points out, pedagogy can be concerned with both process and outcome, rather than a false dichotomy of one or the other. Indeed, Bernstein himself acknowledged that such a binary might be too simplistic or rigid for a fair and accurate description of what teachers do,

> '*These generic types [visible/invisible pedagogies] can take either progressive, conservative or radical modalities and that theories of instruction will act selectively upon both the "what" and "how" of any pedagogic practice'* (Bernstein, 1990, p.70).

Other educational researchers have developed the concept of mixed modalities of visible and invisible pedagogies more fully (see Bourne, 2004, for example, for further discussion) but for the purpose of this thesis I will focus on the concepts of visible and invisible pedagogies as a means of examining teachers' mediation of their A level specifications and its stipulated critical thinking outcomes with Critical Thinking processes aiming to support such outcomes. In the context of this research, the "what" of pedagogic practice is determined, in most part, by the A level specifications which include their own disciplinary specific critical thinking outcomes that are clearly 'visible' in all three classrooms featured in this study. However, it appears that it is the "how" that provides scope for a greater degree of teacher agency and where Critical Thinking processes are drawn upon. Indeed, it may be argued that critical thinking outcomes as required by the A level and Critical Thinking pedagogy as enacted by teachers in this study reside in both visible and invisible pedagogies. It is this apparent paradox which I will return to and discuss more fully in chapter seven.

In summary, I have outlined in this section key concepts from Bernstein that elaborate on issues identified from section one, notably the impact of current policy on reinforcing a curriculum based on strong subject classification and the subsequent implications for pedagogy. However, as has been explained, pedagogical consequences may not be as uni-directional as originally presented by Bernstein. Indeed, the concepts of both visible and invisible pedagogies will prove helpful in uncovering the complex interrelationship between A level specifications, Critical Thinking processes and critical thinking outcomes in the classrooms featured in this study.

2.3 Conclusion to the Chapter

I finish this chapter in the same way I opened it, with a reminder that the primary focus of this thesis is that of teachers' classroom practice in terms of their enactment of Critical Thinking in their A level teaching. As widely appreciated, classrooms are complex sites, and teaching is an equally complex activity (Wragg, 1999; Shulman, 2004; Bloome et al, 2008; Hall, Murphy & Soler, 2008; Cochrane & Lytle, 2009; Li Li, 2011). The theoretical hinterland surveyed in this chapter, therefore, is to be understood in the context of that complexity. To that end, I have attempted to survey key theoretical issues relevant to this study in relation to Critical Thinking and the questions it raises for classroom application. However, this study also serves as a case study within the wider context of teacher professionalism related to how teachers interpret and translate into their own practice a theoretical pedagogical model. In the first part of the chapter I addressed issues from the field of Critical Thinking, with specific reference to conceptualisations relevant to this study, namely: argument; a normative view; and a disciplinary specific view. The role of a trans-disciplinary model to address pedagogic issues arising from these conceptualisations was also examined and provided the context for the use of Paul's model featured in this research. Emerging from this exploration was a key distinction between critical thinking as outcomes and Critical Thinking as pedagogical process, presented as a CT/ct construct, which was further illustrated by the apparent links made between Critical Thinking and other pedagogical conventions such as Bloom's taxonomy; socio-constructivist approaches, and metacognition. As a result, the first part of the chapter addressed issues of pedagogy generated within the field of Critical Thinking and how these might relate to the classroom.

In the second part of the chapter, I located these issues within the wider field of teacher practice, examining the influences which may encourage or hinder the transfer of a pedagogical model, in this case a Critical Thinking model, from theory to practice. Indeed the very notion of a direct 'transfer' was challenged with reference to Eraut, amongst others, by examining the complex and more symbiotic relationship between theory and practice. Such a relationship appears to be subject to influences emanating from the individual teacher context; the role of the institution; and the pressures exerted by national policy and a high accountability framework. Such issues were examined in the final section of this part of the chapter with specific reference to Bernstein's concepts of classification and associated visible and invisible pedagogies which, I argue, will provide a helpful lens through which to examine the complex interrelationship between A level teaching and Critical Thinking as enacted by the teachers in this study.

At the end of this chapter, it is pertinent to recall Dewey, (1934) who advises that the way to carefully re-examine a concept is to view 'it' in the relation to the practice of 'it'. As such, this thesis is an examination of the concept of Critical Thinking in relation to three teachers' practice of 'it'. The specific nature of this empirical enquiry into teachers' understanding and use of Critical Thinking based on Richard Paul's trans-disciplinary model will be presented in the following methodology chapter.

Chapter 3 Methodology

The dearth of research on Critical Thinking in secondary school classrooms was highlighted in the Introduction and, therefore, through this study, which constitutes a practice-based examination of Critical Thinking, I aim to contribute to the call for empirical research into 'the kinds of classroom experiences that help students meet these goals [of Critical Thinking]' (Haroutunian-Gordon, 1998, p.424). By adopting the stance that research methodologies are not distinct from the objects of their study (Bloome, Power-Carter, Morton Christian, Otto & Stuart-Faris, 2004), the purpose of this research, to investigate teachers' interpretation and application of a Critical Thinking model, contained inherent within it implications for the research design. In other words, the purpose of the research and the nature of the questions I posed influenced my choices over methodology and research design. In this chapter, therefore, I describe how I conducted this research as well as reflecting on methodological issues that arose and how I addressed them. The chapter is organised as follows: firstly, I outline the methodological traditions which inform this research; secondly, I examine issues in relation to the research site, the teacher participants involved, and my role as researcher; thirdly, I present the research design and associated data collection methods; I then outline the analytic procedures adopted leading to a final section giving an overview of the data analysis to follow in chapters four, five and six.

Ethical approval was given for this research February 2013, Reference Number: REP (EM)/ 12/13-37 (See appendix C).

3.1 Methodological Traditions Informing this Study

My research questions governing this study, as developed and presented in the Introduction, were as follows:

1. How do the participant teachers in this study interpret the term 'Critical Thinking'?
2. How do these teachers' translate their interpretations of Critical Thinking into pedagogical practices in their disciplinary specific A level classrooms?

3. How does the context of teaching for high stakes AS and A level examinations with their associated disciplinary specific expected outcomes bear on the Critical Thinking pedagogical practices presented by these teachers?

In order to address my research questions, I drew on an amalgam of inter-related research traditions which comprised ethnography, case study, and micro-ethnography, all of which supported my purpose, as stipulated above, of investigating empirically teachers' use of Paul's Critical Thinking model in the context of their A level classrooms. This will now be examined more fully.

3.1.1 Ethnography

It is clear from the questions outlined above that this study seeks to describe and understand what was happening in a particular situation amongst a particular group, in other words, what teachers understood about Critical Thinking and how this was played out in terms of their pedagogical practices in the A level classroom. The specificity of the study reflects the key features of an ethnographic research design which has been defined as ' a theory building enterprise constructed through detailed and systematic observing, recording and analysing of human behaviour in specifiable spaces and interactions' (Heath & Street, 2008, p.29). In other words, the focus is on the 'here and now' as the researcher aims to understand what is happening in this field site amongst this group of people (Agar, 2008; Heath & Street, 2008). Once 'out there' in the field the researcher seeks to develop an 'emic' perspective, that is to understand what is happening from the perspective of the 'insider' or those forming the focus of the study, in this case, from the perspective of teachers who claim to be implementing Critical Thinking. Yet, once the researcher or 'outsider' (Agar, 2008) starts to engage in interpretation and attributes to her findings a relevance to the wider field, in this case to the wider fields of Critical Thinking, pedagogy, and teacher professionalism, the interpretation given to that understanding by the researcher will constitute an 'etic' perspective. The emic/etic relationship takes on a particularly complex dimension in the context of this study, given my role as researcher, as a senior leader in the school, as well as the person who had worked with participant teachers on developing Critical Thinking. This will be examined more fully below (see p.52).

My study, however, does not constitute a full ethnographic account; rather it is better described as 'adopting an ethnographic perspective' (Green & Bloom, 2005, p. 183) where the research project is not a comprehensive ethnographic study but is 'a study of particular aspects of everyday life and cultural practices of a social group'. In this context, the focus is teachers' interpretation of Critical Thinking and the translation of such an interpretation into their pedagogical practices.

A further feature of an ethnographic study is that its purpose is to find out a genuine unknown, rather than to 'test out' a hypothesis (Heath & Street, 2008). Indeed it is the absence of detailed knowledge of teachers' understanding and practice of Critical Thinking in the classroom that provided the rationale for this study, as outlined in the Introduction. A logical consequence of an ethnographic approach, therefore, is a requirement on behalf of the researcher to be ready not to approach her field with a set of predetermined definitions or ideas, in this case, of what constitutes Critical Thinking in the classroom, but to construct an understanding derived from actually observing teachers using or 'doing' it as located in teachers' speech, gestures, use of materials and texts, and students responses (Street, 2004). In this respect, a further distinguishing characteristic of ethnographic study is its dialectic approach (Agar, 2008) or 'the constant comparative' (Heath and Street, 2008, p.32) whereby categories for interpretation emerge from the process of data collection and analysis, and in turn inform further collection and analysis. The implications of this for my sequencing of data collection activities will be explored more fully later in the chapter (see p. 56 below).

3.1.2 Case Study

As indicated above, an ethnographic approach is generally based on intensive discussions and observations of a small number of participants aiming to learn or understand something of 'the interrelationships of a large number of discovered variables' among them (Agar, 2008, p. 134). As such, there is a clear overlap between an ethnographic approach and case study, or what is understood as ethnographic case study (Merriam, 1998). In this research I focus on three teachers, each of whom constitute an analytical unit of 'a case' of a teacher engaging with Critical Thinking in his/her A level teaching, through which I explore the research questions outlined in the Introduction. This does raise the issue of generalisability, where the principle of enumerative induction would imply that, in my study, claims could only

be made for teachers' use of Critical Thinking in the context of those specific teachers who constituted the study. However, this does not preclude the study from having a 'wider resonance' (Silverman, 2001, p.249; Brewer, 1994). Yin's (2014, p.42) concept of 'analytical generalisation' challenges the idea implicit in the enumerative position that numbers alone constitute the basis on which inferences can be made about the wider applicability of what is uncovered. In this sense, I argue that my study, through the investigation of the practice and perspectives of a small group of teachers, has a wider resonance in terms of shedding light on understanding the development of pedagogical practices in relation to Critical Thinking which may go beyond that of the immediate locus of the research. In other words, whilst classroom practice is by definition 'local,' and therefore research into it is a highly situated process, its findings can contribute to developing, elaborating upon or critiquing wider theoretical frameworks or processes (Cochrane & Lytle, 2009). However, in all cases, it is incumbent on me as the researcher to set out clearly and explicitly the grounds for which connections are made between the data, on one hand, and theory or wider processes, on the other. This will be addressed in the data chapters (ch.4-6) and more fully in the discussion chapter (ch.7).

3.1.3 Micro-ethnography

At the centre of what happens in any classroom is language, both written and spoken, as used by teachers, students, texts and textbooks, exam papers, syllabi and school policies, for example (Bloome et al, 2004). Consequently, to understand what is happening in a learning situation requires a close analysis of the language used. Indeed, in the context of Critical Thinking, I identified in the theory chapter a potential alignment between socio-constructivist approaches to teaching and Critical Thinking, with the primacy of teacher-student interaction as the locale where Critical Thinking can best be promoted (Li Li, 2011; Miri et al, 2007). Detailed analyses of the linguistic exchanges incurred through such interactions conform to the principles of micro-ethnography which aims to analyse particular 'interactional moments of meaning construction' (Hicks, 1996, p.115) or 'thick description in motion' (Bloome et al, 2004, p.52). As a result, I adopted techniques in keeping with a micro-ethnographic approach including audio recording of teacher talk and teacher/student interactions in lessons in order to analyse social and linguistic features of given interactions. In other words, a micro-ethnographic approach provided me with a step-by-step, moment-by-

moment illustration account of how patterns of student-teacher interaction in an A level classroom may have contributed, or not, to the promotion of Critical Thinking in a specific context.

To summarise, in this section of the chapter I have outlined three interrelated methodological traditions and their pertinence in relation to the research questions I pursued in this study. Specific issues arising from these, notably my role as researcher; my relationship with the research site; and the selection of the teacher participants who made up three case studies will now be examined in further detail**.**

3.2 Methodological Issues

3.2.1 My Role as Researcher

The role of the etic/emic distinction within an ethnographic approach, as Agar (2008) has pointed out, is not always clearly defined, making it difficult to discern exactly where 'emic' ends and 'etic' begins. In relation to my study, the emic viewpoint was ostensibly that of the teacher participants; and the etic perspective was developed by me through my interpretation of the significance of my findings. However, the distinction is not so clear-cut. An ethnographic perspective requires the researcher to participate in the world of her participants as a means of accessing the information required to answer her basic question of 'what's happening here?' Consequently, she is part of the world she studies and also comes to that study with a particular point of view. As Agar (2008) points out, the researcher has a biography and particular interests that explain why the ethnographic study takes the shape it does. In this particular study, my interest in teachers' use of Critical Thinking derives from my own personal and professional history: I have developed Critical Thinking myself in my own teaching; and have designed and facilitated a professional development programme over a number of years, working with groups of teachers on developing a Critical Thinking pedagogy. Therefore, investigating what teachers actually do with their understanding of Critical Thinking following their involvement with the professional development programme was an issue of genuine professional and intellectual interest for me. Interview and lesson observation data was drawn from the classes of those teachers with whom I had worked on the programme (see below). In these contexts, the ethnographic mantra of 'making the familiar strange' (quoted in Heath & Street, 2008, p.32) presented a

challenge. It is clear, as Agar (2008) puts it, that I entered the field carrying 'baggage' given that I would have acquired through my own experiences implicit assumptions around Critical Thinking and classroom pedagogy. What counts as a 'finding' or 'category' will in itself be determined by background expectations and therefore to some degree be an expression of my own or institutional self (Hammersley & Atkinson, 2007, p.236). In this case, Agar's (2008, p.20) comment, 'we have met the other and they are us' is highly pertinent to me in relation to this study.

In this context, Todorov's (1988) concepts of 'proximity' and 'distance' are relevant here in the form of a conscious effort on my behalf to develop a form of 'psychological' proximity and distance in relation to Critical Thinking, Critical Thinking pedagogy and the teachers with whom I worked on the professional development programme. I cannot claim, to be 'neutral' but, in accordance with the principles of 'reflexivity' (Foley, 2002), I needed to be explicit about what kinds of bias may exist by bringing them to the fore and acknowledge them when drawing conclusions during analysis. In fact, as will become clearer in the data chapters, the findings that emerged from the iterative process of data collection and analysis challenged the primacy that I had initially accorded Critical Thinking at the start of the research which, during the course of the research, transferred to the primacy of teacher agency in which Critical Thinking played a more subservient role.

Further examples of actions I took to mitigate against unduly influencing teachers and students throughout the study and to maintain a high degree of reflexivity will be included with reference to specific data collection methods (see p.56 below).

3.2.2 The Research Site

The research site, N school, was a secondary school in London for students aged from 11 to 18, serving a multi-ethnic urban and mixed socio-economic community. At the time of the research there were 1420 students on roll including 342 in the Sixth Form. The school had been rated as outstanding at its previous Ofsted inspection of 2008 and again at the inspection conducted during the time of the research in May 2013. It transferred out of Local Authority control to become one of the first 'Outstanding Converter Academies' in September 2010; and subsequently it was amongst the first tranche of schools conferred with Teaching School status in 2011 with a focus on initial teacher training, teacher development, and leadership development. As a result, the Critical Thinking Professional Development

programme with which the participant teachers had engaged prior to this research, formally endorsed and encouraged by the school leadership, was part of a wider institutional cultural context with a strong emphasis on teacher development and professional learning. In relation to Sixth Form performance, at the time of the research, it was in the top 25% of schools nationally in terms of value-added outcomes as calculated by Advanced Level Performance Systems (ALPS). Recruitment and retention rates at the time were high so a significant number of students from the school continued with Level 3 (post GCSE) study in the Sixth Form. This was the school where I had worked from 1997-2004 as a French teacher and teacher of AS Critical Thinking; Head of Department 2004-2008; Assistant Headteacher 2008-2010; Deputy Headteacher from 2010. As such I was an established and senior member of staff during the period of the research. The implications of this for the conduct of the research, and notably the potential impact on data collection is examined more fully with reference to specific research methods in part three of this chapter below.

3.2.3 Teacher Participants

Sampling[3]

For my study a purposive sample of three teachers was selected based on their prior involvement in the Critical Thinking professional development programme run at the school and on their self-identification as applying their learning to their A level teaching. In addition, the three teachers came from different curriculum areas, which provided an opportunity to explore possible differences or similarities in terms of Critical Thinking enactment across differing discipline areas. A sample size of three was appropriate for an ethnographic approach where typically the sample size is small (Agar, 2008). As examined above, each teacher constituted 'a case' and a unit of analysis in the data section.

Teacher M

M was a teacher of AS history and AS and A2 politics. He joined the school as a newly qualified teacher (NQT) in 2005. He was appointed assistant Head of Year in 2007; Sixth

[3] At the outset of the research, I had considered a two-group design, drawing a second group from teachers who had just started to engage with the Critical Thinking professional development programme. Combined with the initial group, this would have provided a sample of participants at different stages in their understanding and use of Critical Thinking to provide a contrastive perspective. However, it became clear that this would have made the scope of the study too broad and unwieldy for the purposes of this thesis.

Form Head of Year in 2008; and at the time of the research was Director of the Sixth Form. He was one of the first teachers to engage with the series of Critical Thinking workshops as part of the school's twilight professional development programme over the course of two academic years, 2007-2009 and he was one of four teachers from N. School to attend the International Conference on Critical Thinking run by the Critical Thinking Foundation in July 2009, led by Richard Paul and Linda Elder, which I also attended (see appendix A)

Teacher J

J was a teacher of AS and A2 biology. He joined the school in 2006 as an NQT after completing the Graduate Training Programme (GTP) at a local school, which meant his initial teacher training took the form of on-site training whilst teaching in school, in place of the PGCE university route. He was a main scale science teacher for three years and in 2009 became Head of A level biology and BTEC science, an alternative science qualification to GCSE. In 2010 was appointed Key Stage Five Science coordinator of all A level provision in science. In 2012 he was appointed acting Head of Department, and then in 2013 he moved from Head of Department to Director of Pedagogy in science. He was a participant in the Critical Thinking professional development programme that ran as part of the school's Teaching School training offer in the autumn term of 2011 (see appendix A). He also attended a British Council conference on Teaching in Science held in India in the summer of 2012. Having worked with one of the school's Advanced Skills Teachers on meta-learning, he set up a cross curriculum working group on 'good to outstanding teaching' in September 2012. He was not one of the teachers who took part in the International Conference of Critical thinking.

Teacher L

L was a teacher of the AS and A2 philosophy of religion units which at the time of the research constituted 50% of the AS and A2 philosophy and ethics qualifications. L joined the school in 2000 as an NQT for Religious Studies (RS). In 2004 she was conferred with Advanced Skills Teacher status (AST). In 2011 she became Head of RS. She was one of the first teachers to engage with the series of Critical Thinking workshops as part of the school's twilight professional development programme over the course of two academic years, 2007-2009, and she also joined M and me at the International Conference on Critical

Thinking. All students at N school studied GCSE Religious Studies in Years 10 and 11 and were entered for the full GCSE exam at the end of Year 11. RS GCSE outcomes were high for the school, with the national school data set indicating a 4 year trend of GCSE results being significantly above the national average at the time of data collection for this study. As can be seen, the career trajectories of the three teachers at the time of the research are suggestive of strong pedagogical skills. In addition, they had engaged voluntarily with the Critical Thinking professional development programme which could be seen as indicative of a professional interest in the subject and in developing further their pedagogy. Their use of Critical Thinking and the findings presented in the data chapters will need to be understood in the context of this experience and professional interest.

In this section, I have clarified the nature of my professional relationship with the research site and research participants, and I have explored the issues this raised for my role in conducting this research from an ethnographic perspective. I will now examine in more detail the data collection methods used, including an opportunity to explain more fully the actions I took to address issues arising from my role as researcher.

3.3. Research Design and Data Collection

Given the purpose of this research was to examine teachers' interpretation of Critical Thinking and their translation of that interpretation into their A level teaching practice, the data collection methods chosen would be those closely allied to that goal. In other words, as Woolcott (1994) highlights, what is included as data is itself the product of an analytical act. For each teacher I conducted an initial interview that was recorded and transcribed. This was then followed by the observation of six lessons over the course of three and a half months for each teacher leading to a total of eighteen lessons. For reasons of scope and economy, I will be reporting on nine lessons, three per teacher in the subsequent data chapters (chs.4-6). The lessons selected were those where teachers' pedagogic actions, the focus of the research, were more consistently foregrounded, as opposed to lessons where students were working for more extended periods of time independently, or continuing with work already set up by the teacher in a previous lessons. During observation lessons, teachers wore personal recorders to capture interactions with the class as a whole, groups, and individuals that I subsequently transcribed. In addition, video recording meant aspects

of classroom layout, teacher movement around the class, interactions with groups and individuals could be captured and inform analysis of practices in the classroom (Bloome et al 2004). Furthermore, teachers watched the recording of their lesson with me between two to five working days after the original lessons and their commentary on their lessons was also recorded and transcribed. The collective data for each teacher provided material for a deep and systematic analysis leading to three case studies that will constitute the data section (chs. 4-6) of this thesis. To summarise, the data set used across all three case studies is laid out in table 3.1 below.

Data source	**Quantity**	**Format**
Interviews	3	Transcribed audio recording
Lesson observations	9	Transcribed audio recording Video recording from a fixed position
Teacher commentary on lessons	6	Transcribed talk of each teacher's commentary on the lessons
A level specifications for each subject [4]	3	The documents available from the relevant exam board
Critical Thinking resources	4	Published materials and guides from the Critical Thinking Foundation specified as appropriate in each case study
Lesson resources	16	Teacher produced electronic slides; class whiteboards; worksheets; textbooks; video-clips
Student outcomes[5]	3	Written exam answer; whiteboard notes; written paragraph.

Table 3.1 Summary of the data used for the Case Studies.

Specific data collection methods of interview and observation will now be elaborated upon further in terms of issues raised and how I addressed them.

3.3.1 Combination of interview and observation

Within the field of ethnography, the status of the interview in relation to participant observation has been a contested one (Gaskell, 2000;Hockey & Forsey, 2012;) where participant observation has traditionally been credited with greater 'authenticity' (Hockey & Forsey, 2012). However, Forsey (2008) argues that, rather than being supplementary and separate to participant observation, the interview has become an expected and accepted part of the research process and is an integral part of what constitutes participant observation. Indeed, a combination of both methods serves a dual and complementary

[4] This data was collected in 2013. From September 2015 onwards there were changes to A level specifications, the implications of which for this study are explored in the Conclusion Chapter (see ch.8).
[5] The focus of this thesis is on how *teachers* use Critical Thinking in their teaching; student work is used as part of the data only where it serves to illuminate teachers' pedagogic actions in relation to Critical Thinking.

purpose of generating a 'thick description' (Geertz, 1973) whilst contributing to the rigour of the research process by providing a mutual check on what can be claimed. In relation to my study, given I wanted to access not only teachers' practices but also their perspectives on what they were doing with Critical Thinking, observation and interview complemented each other as appropriate methods of data collection.

However, the relationship between observation and interview could be said to be more than one of just complementarity; it could be described as a dynamic symbiosis, where data from one source served to inform and illuminate my approach to another. This had implications for my sequencing of observations and interviews/commentaries, to allow both data sources to feed into each other. I conducted an initial interview with each of the three participants which was followed up with observations spaced over a period of fourteen school weeks. The video-audio recordings provided further opportunities for continuing discussions and reflections between the teacher and myself as we watched recordings together before proceeding with the next observations (see p. 61 below for a more detailed examination of the use of video recordings). I shall now examine each data collection method more closely, addressing issues arising from my execution of the research.

3.3.2 Interviews

Interviews took place in a private office on the school site and were recorded by an audio recorder. The interviews took the form of semi-structured interviews, with some framing prompts (see appendix D). However, taking into account the experience of the teachers participating in this study, as referred to above, space was given to allow discussion to flow according to the directions taken by the teachers (Spradley, 1979).

The literature alerts the researcher to the fact that the accounts gained from interviews can function at two levels (Silverman, 2001; Hammersley & Atkinson, 2007; Skinner, 2012): firstly, for what they can tell the researcher about the phenomena to which they refer at a conscious level; secondly, for what they reveal when analysed, in terms of perspectives and viewpoints they imply, and what they may suggest about wider subcultures and cultures to which the interviewee belongs. Whilst the researcher must be wary of assuming interviews provide direct access to cognitive processes which are taken to provide a causal explanation of behaviour, treating them as 'reality reports' (Silverman, 2001, p.108), Walford (2008, p.12) highlights, 'what people believe to be the reality of their world must be important information

in understanding their activities, meanings and relationships, in working out “what is happening here”’ (Wolcott, 1994).

Threats to the credibility of interview data are well documented in the literature, including the interviewee giving the ‘answers’ they think are expected of them (Skinner, 2012) or conversely, purposefully subverting their answers. The very fact of establishing an interview context could create a self-consciousness on behalf of the interviewee which could affect his/her responses (Rapport, 2012). Both of these are of relevance to my study where I had an established professional role with participant teachers, having led their professional development programme, as well as my role as Deputy Headteacher.

I attempted to address this by prefacing my request to them to be a research participant, and repeated prior to the start of interviews and subsequently throughout the data collection process, that my role was that of a curious inquirer; and that although I had an understanding of the Critical Thinking model, I was not a specialist in their subject areas and therefore I was looking to learn about how they had used the work they had undertaken on Critical Thinking in their subject. This was not a ‘ruse’ but a genuine clarification to be made to alert participants to my ‘investigative’ role as opposed to one of ‘evaluating’ their teaching. As a result, I took a reflective stance when transcribing and analysing interview data, alert for possible indications of my role as Critical Thinking facilitator and/or senior leader influencing responses. An analysis of the interview data (see chs.3-5) would indicate that all three teachers were frank and open in terms of their discussions about Critical Thinking suggesting an ownership of the Critical Thinking model on their own terms, rather than a sense of ‘deference’ to me.

3.3.3 Observation

Given that my research focus was to learn about teachers’ interpretation of Critical Thinking and how they translated that interpretation into in their A level classrooms, observation as a means of gaining ‘understanding and insights into how different people perceive and interpret events, how they behave in specific contexts and how they interact with others’ (Simpson & Tuson, 2003, p.12) was a primary data collection method. The lessons observed were naturally occurring lessons and the lesson content appeared to align with what would be appropriate in terms of preparing students for upcoming A level or AS exams and therefore did not suggest that they had been artificially constructed for the purpose of

the researcher (see appendix F for details of lesson content). Students appeared to be familiar with ways of working presented in the lessons, suggesting such approaches in these lessons were no different from established ways of working.

Teachers wore personal recorders to capture interactions with the class as a whole, groups, and individuals that I subsequently transcribed. In addition, video recording meant aspects of classroom layout, teacher movement around the class, interactions with groups and individuals could be captured and inform analysis of practices in the classroom. (Bloome et al 2004). In addition, video and audio recordings provided a permanent record of transient classroom interactions which were then analysed at several levels (Simpson & Tuson, 2003; Leung & Hawkins, 2011) supporting, as was outlined above, research into micro-contexts in relation to Critical Thinking activities, by paying close attention to what was happening between teachers and learners in the classroom (Li Li, 2011). As a result, the records generated through observation were more detailed and descriptive than those generated by interview.

Although my prime focus for observation was the teacher, in a classroom context where I was focussing on pedagogical practice, students could not be marginalised. As with the teachers, permission was sought from students to include them where appropriate on the teacher's personal voice recorder, and also in the video recording of the lesson, as part of the procedure of securing ethical approval. However, at the start of the research I clarified, and regularly reinforced with them, the idea that my role as observer in their lessons was that of researcher curious about what their teacher was doing, rather than as Deputy Headteacher making judgements on their learning.

My role as observer in this study consisted of me observing from the back of the classroom, making my own contemporaneous notes along with overseeing the recording of the lessons, therefore I was not participating in the lesson other than as a researcher observer. However, there are particular risks to a study where teacher researchers investigate classroom contexts with which they are familiar. First, it is easy to miss or ignore 'invisible messages' about what is happening precisely because it is too familiar or, if noted, they are taken at face value, failing to see them with a critical eye. Secondly, it is also difficult not to come to a premature judgment or evaluation of what is happening in the lesson, focussing on what one might expect as opposed to what is actually happening (Frank, 1999; Wragg, 1999; Delamont, 2008). Both of these risks raised pertinent challenges for me, given the work I had

carried out with Critical Thinking alongside teachers since 2007. Furthermore, given my role in school as Deputy Headteacher with responsibility for evaluating teaching and learning, lesson observations in my professional role assume a different character where interpretation and judgment based on a set evaluation schedule had become 'automatic' for me. I made a highly conscious effort to focus on recording descriptive accounts of what I observed, to ascertain if I were 'attending as carefully to what is going on as I am attending to what *I think* is going on? (Author's emphases) (Wolcott, 1994, p.21). My reflection in my research journal refers to how my notes from an initial observation revealed a tendency towards evaluative comments rather than capturing a rich description of what was happening. In an attempt to discipline myself after this, I divided the pages in my notebook into two sections: 'description' with a subheading of 'what's happening', and 'my questions' (no evaluation), with description taking a larger proportion of the page (see appendix E). A further mechanism which provided me with the means of securing a higher degree of reflexivity in terms of my use of lesson observation data was video and audio recordings of lesson observations. However, such an approach was not a panacea and presented its own issues to be addressed.

3.3.4 Video and Audio Recording

Recordings of lessons offer several advantages: firstly, as a permanent record of passing events, they constituted a highly detailed and rich record of events for analysis (Delamont, 2008); and secondly, a recording which can be re-run removes the need for instant judgment or decisions as well as permitting analysis and re-analysis over time at several levels (Wragg, 1999; Baker, Green & Skukauskaite, 2008). Indeed, detailed linguistic analysis of transcripts allows for insights that may be initially missed in the rapid exchanges in classroom interaction (Wragg, 1999; Leung & Hawkins, 2011). This was of particular relevance to my study where I wished to examine how Critical Thinking may be embedded in language, tasks and interactions. However, although a 'permanent' record, an audio visual recording is not a comprehensive record in that it is still selective, based on the positioning of the camera and the limitations of what it can record (Leung & Hawkins, 2011). The positioning of the camera itself is a choice reflecting what the researcher considers to be important and can also affect how the participants respond. In relation to my study, where the focus was on teachers' use of Critical Thinking, the camera was positioned at the back of

the classroom to capture the context of the lesson, materials and resources presented through the interactive whiteboard, and the engagement of the teacher with the class as a whole. Such video footage did however, allow moments of interaction to be captured, when illustrative of, for example, participation structures at play in a particular episode, some of which feature in the data chapters (chs.4-6) The use of portable audio recorders worn by each teacher captured the linguistic exchanges the teacher had with students at whole class, group and individual level.

However, as Leung & Hawkins (2011) point out, recordings are also selective in another sense, in that a lesson is rarely a 'stand-alone' but is part of a sequence of lessons which will contain events or activities linked to prior learning or looking forward to future lessons, neither of which are available to the researcher in any form of recording. Such recordings constitute a type of field note on which the researcher records a particular dimension of classroom life, but not the whole of it (Leung & Hawkins, 2011; Baker et al, 2008). As such, these observation recordings were therefore supplemented with teacher commentaries.

3.3.5 Teacher Commentaries on Lesson Recordings

The use of the lesson video recording as a focus for discussions with the participant teacher being observed was one way of addressing its partial nature, with teachers being given the opportunity to supply further details such as locating the observation within a wider context of lesson sequences and student learning. In addition, Wragg (1999) and Loizos (2000) suggest such an approach provides richer, more detailed accounts and discussion of intentions and perspectives than interviewing without the recording. Furthermore, by engaging teachers in the discussion of the observation, I was ensuring participant voices were represented more fully in the research, enhancing the 'emic perspective' which, in turn, helped to safeguard against me attributing meaning to actions without checking (Leung& Hawkins, 2011).

To summarise, in this section I have outlined the approaches I adopted to data collection including an account of actions I took to attempt to mitigate against the influence of my professional role on data collection processes and to support and sustain a reflexive stance towards my data. In the final section I clarify the analytic procedures I adopted in terms of analysing interview, commentary and lesson data, including the analysis of texts relevant to interview and lesson data.

3.4 Analytic Frameworks and Procedures

The outcomes of the analysis to be presented have been informed by Eraut's (1994) concepts examined in chapter two of 'public propositional knowledge', 'personal propositional knowledge' and 'practical personal use' or 'action knowledge'. The relationship between these forms of knowledge are explained thus,

> *' Public knowledge which gets incorporated into action knowledge undergoes a process of personalisation in which some interpretations and uses become prominent while others get neglected. Hence its personal significance and meaning will show some variation between one professional and another.' (Eraut, 1994, p.18)*

In the context of this study, the A level specifications exist as a form of 'public propositional knowledge', constituting a general articulation of the requirements of the course framed mainly in terms of expected outcomes. Similarly, Paul's Critical Thinking model 'exists' in terms of an abstract trans-disciplinary framework as presented in the materials produced by the Critical Thinking Foundation (see appendix A). As a result, drawing on the concepts of 'interpretation' and 'translation' (Ball et al, 2012) as developed in chapter two, data in these case studies is analysed in terms of how it illuminates the teachers' processes of interpretation of their A level specifications and Paul's Critical Thinking framework into their own 'personal propositional knowledge' and how, if at all, it is translated 'action knowledge' as manifested through the pedagogical practices observed in their lessons.

I will now elaborate upon the analytic procedures I adopted in relation to interviews, observations, teacher commentaries, and textual analysis of documentary evidence in order to trace these processes of interpretation and translation.

3.4.1 Analytic Procedures applied to Interview Data

As interviews were conducted with participant teachers prior to any observations, my analysis of these provided a lens through which initial observations were framed (see below). I adopted a dual approach to the analysis of interview data: firstly, I coded the data in terms of topics raised which were then organised into categories (Hammersley & Atkinson, 2007); and secondly, I carried out an in depth discourse analysis of language used to identify relevant patterns.

Categories across all three interviews included:

- Teacher interpretations of Critical Thinking

- Teacher interpretation of A level specifications and critical thinking outcomes
- Student difficulty
- Student ability/competence
- Teacher use of Critical Thinking tools
- Other professional knowledge/theories teachers bring
- Teacher agency
- Imperative of the A level exam

From a discourse analysis perspective, I drew on a range of discourse analytical tools such as transivity, modality, key words, wording, metaphor (Fairclough, 1993), stance taking, indexicals, repetition, intonation (Johnstone, 2008) to develop further my analysis of interview data. As a result, the data analyses of initial interviews were used to provide a portal through which lesson data were subsequently analysed. Guiding questions arising from interview data for the analysis of subsequent observation data consisted of the following. As can be seen, these offered a progressive drilling down into the classroom data from broader pedagogical practices; interactions resulting from such practices; and then a micro-ethnographic analysis of such interactions:

- How does each teacher's interpretation of the nature of their subject, their subject's A level specifications, Paul's Critical Thinking model, as presented in the analysis of their interview, translate into specific pedagogical practices in the actual classroom?
- What does observation data indicate about the nature of classroom teacher/student and student/student interactions generated by such pedagogical practices; and how do these practices relate to pedagogical features explored in the theory chapter?
- What does a micro-ethnographic approach to discourse analysis of such classroom interactions reveal about the teacher's interpretation of Critical Thinking and its translation into practice in the context of their A level class?
- Are further issues raised in terms of the relation between theory and practice in terms of Critical Thinking and pedagogy?

3.4.2 Analytic Procedures applied to Lesson Observation Data

Given the multi-faceted nature and complexity of any classroom situation (LiLi, 2011), understanding and interpreting the data from lessons will consist in several layers of description, analysis and interpretation (Wolcott, 1994). Whilst the interpretation of this data will be the focus for the discussion chapter later in the thesis (ch.7), the process of analysing lesson data comprise: the context of the lesson; segmenting the lesson; analysing

interactions within a segment; and finally, discourse analysis influenced by a micro-ethnographic approach, including analysing participation structures (Bloome et al, 2004) of linguistic exchanges within an interaction. In addition, further layers are added by each teacher's interview; their own commentaries on their lessons and my analysis of that interview and commentary data. These will now be elaborated on further.

3.4.2.1 The Context of the Lesson

As referred to above, a lesson is rarely a 'stand-alone' event but is part of a sequence of lessons which will contain activities which are linked to prior or future learning (Leung & Hawkins, 2011), Furthermore, such a sequence is also located within a wider context of relevant events in the school and more widely in educational institutions. Therefore, to understand more fully the significance of what is happening in a particular lesson, a wider context of the sequence of lessons of which it is a part is important. In this study, such information is supplied through interviews, references made in the lessons themselves, and also through teachers' commentaries on the recorded lessons.

3.4.2.2 Segmenting the Lesson

The purpose of lesson observation data in the context of this study, as outlined more fully above, was to enable direct access to the pedagogic interactions which were the focus of the research. As a result, not all aspects of a lesson were analysed; only those episodes identified as being salient to the issue under consideration or constituting 'significant events' (Simpson and Tulson, 2003, p.25). What constituted a 'significant event' therefore needs to be clarified. Lesson observation, in the context of this study, is used to provide direct access to the sorts of interactions in the classroom which serve to ascertain what might constitute 'Critical Thinking oriented approaches'. This is based on Leung and Hawkins' (2011), reference to 'EAL oriented approaches', whereby teachers adopt specific pedagogical actions to facilitate English language learning for EAL students in a mainstream classroom. Similarly, pedagogical actions adopted by teachers to facilitate students' Critical Thinking as presented through what they read, write and say was a focus for classroom analysis in this study. As a result, I did not include in the analysis episodes related to classroom management, for example. Rather, I identified segments where the teacher and students were engaged with the propositional content of the subject, as it was here that opportunities

for Critical Thinking oriented interactions were most likely to be located. Such areas of focus consisted of approaches to the use and structuring of group discussion; use of texts (textbooks; handouts; artefacts; images); the construction of written texts; learners contributions and teacher responses to those contributions; teacher positioning of learners; sequencing and organisation of teacher-student interaction (Stubbs, 1993; O'Connor & Michaels, 1996; Gee, 2011); and opportunities for 'extended conversational exchanges' (Rex & Schiller, 2009, p.8) between teachers and students. Once identified, these interactions were analysed at two levels: at the level of the task or activity itself and the extent to which the orchestration of such tasks provided the potential for the development of Critical Thinking; and at the level of the linguistic exchanges produced by the tasks, to assess how, and the extent to which, if at all, such thinking was manifested.

3.4.2.3 Micro-ethnographic Approaches to Discourse Analysis

I adopted a micro-ethnographic approach to discourse analysis, as referred to above (see p.51) to scrutinise in detail interactions between teachers and students to identify patterns or moves within exchanges to see how, if at all, Critical Thinking oriented moments could be identified and explored. In addition to the discourse analysis tools outlined above in terms of the analytical procedures used for interviews, the context of the classroom meant I analysed closely the interactions taking place within the context of Critical Thinking oriented approaches, paying close attention to participation structures (Bloome et al, 2004). These are understood in this study as 'shared expectations amongst participants regarding the patterns of turn-taking protocols for a particular type of situation or event' (Bloome et al, 2004, p.28), with a frequently occurring structure found to be the IRF sequence (Initiation – Response- Feedback) (Bloome, Carter, Christian, Otto, Stuart-Faris, Madrid & Smith, 2008). This provided a starting point for the analysis of Critical Thinking oriented interactions by analysing the nature of the question or initiation presented by the teacher and subsequent student response. Within this context, I also looked at topic control (Fairclough, 1993) in relation to determining the opportunities, or not, for promoting student autonomy or independent thought within such interactions. I also drew on and adapted, where relevant, the structures Eggins and Slade (1997) apply to analysing moves within casual conversation, such as opening, prolonging, monitoring or elaborating moves, for example, to trace the complexity of interactional moments, especially in relation to the roles adopted by teachers

and students within such exchanges. Such an approach facilitated my examination at the micro-local of teacher-student interaction of what was happening, for example, to address misconception or to scaffold or promote types of thinking or understanding which may suggest the development of 'Critical Thinking' within a given context. In addition, an analysis of 'moves' also served to surface other relevant rhetorical modes, such as the development of argument or chains of reasoning, seen in some disciplinary contexts as a form of Critical Thinking, as referred to in the theory chapter (ch.2).

3.4.2.4 Teacher Commentary on their Lesson Recordings

As with interview data, these contributions were analysed at two levels: in terms of codes and categories, and then from a discourse analysis perspective. However, there was an additional dimension to be considered here, which was that these commentaries were a response to what teachers saw and heard from their own lessons, and thus the context is an additional feature to be included. In other words, the commentary data is inextricably linked to the lesson data, it does not stand alone. In practical terms, such commentaries when used in the data analysis chapters accompany the relevant episode from the lesson serving to reinforce, illuminate or develop a particular analytical point.

3.4.2.5 Textual Analysis

Whilst textual analysis is not a central part of my analysis, some documentary evidence does feature as part of the context of this study into teachers' interpretation of Critical Thinking and its translation in their A level classroom practice, and is therefore part of the data set (Hammersley & Atkinson, 2007; Cohen, Manion & Morrison, 2011). As a result, as part of the data analysis outlined above, I conducted a textual analysis of the relevant A level specifications with a specific focus on interpreting performance descriptors; aims of the programmes of study; and assessment objectives in terms of critical thinking outcomes. As such I analysed terms used to assess whether Critical Thinking was referred to explicitly or inherently in relation to processes, outcomes, types of thinking and written genres required for higher level performance in these specifications. Furthermore, another layer of analysis was incorporated in terms of how these specifications were interpreted and drawn upon by the participant teachers themselves in the context of their own pedagogical practices (Stillar, 1998). In some cases, where relevant, textual comparisons were made between A level

specifications and selective extracts from Paul's Critical Thinking materials. Teachers' resources as used in observed lesson were also analysed in relation to the pedagogical practices of which they were part from the perspective of supporting Critical Thinking processes or critical thinking outcomes. Finally, where appropriate, students' outcomes in lessons, in the form of notes or written answers were also included in analyses where, as outlined above, these contributed to an understanding of the pedagogic actions taken by the teacher in relation to Critical Thinking.

3.5 Overview of the Data analysis

The purpose of this thesis is to offer a practice-based examination of Critical Thinking framed within a constructivist paradigm of teacher professionalism. As a result, I explore how the representation of Critical Thinking presented in the theory chapter (ch.2) is interpreted and translated into practice by the three teachers featured in this study, each of whom constitute an analytical unit of a 'case', as referred to earlier in this chapter.

However, each 'case' also consists of several layers of description and analysis (Woolcott, 1994). Firstly, as discussed more fully above, what was included as data for the case studies was itself the product of an analytical act. This was particularly apposite in the context of lesson observation that constituted the primary data source for this practice-based account which was subject to several layers of analysis (see pp.64-66 above). Secondly, by drawing on the analytic procedures detailed in chapter three, I subsequently engaged in a process of identifying 'essential features and systematic interrelationships' within and across the case studies (Woolcott,1994, p.12). Accordingly, the data presented in the subsequent three chapters is framed analytically in terms of the following broad areas:

- Curriculum articulation of critical thinking as embodied in A level outcomes.
- Teacher interpretation of critical thinking outcomes in the context of particular challenges or difficulties these present their students.
- Illustrative examples of how teachers interpret and translate features of Paul's Critical Thinking model into specific pedagogical practices to enable students to address critical thinking outcomes.
- Illustrative examples of discursive practices blended with the Critical Thinking model by the teacher.

However, although these are consistent themes across all three case studies, as each teacher is engaged in his/her own individual acts of interpretation and translation in his/her own disciplinary context, these themes may manifest themselves differently and therefore may be presented slightly differently across the case studies. Indeed, differences arising from the role of disciplinary contexts and personal agency are themselves findings to be explored more fully in chapter seven. The analysis presented in the following case study chapters, therefore, remains very close to the data whereas my interpretation of this analysis in terms of my research questions and with reference to the wider theoretical perspectives presented in the chapter two is addressed in the discussion chapter (ch.7). Given that it is not always possible to keep both analysis and interpretation cleanly segregated, where analysis in the next three chapters (chs. 4-6) appears to be leading into interpretation, I will signal that the issue is to be developed more fully in chapter seven.

As indicated in chapter two, I am using the construct of CT/ct to distinguish between outcomes and processes to support those outcomes. As such, I refer to critical thinking (ct) in terms of critical thinking outcomes as required by the A level specifications, in other words the type of thinking and written genres students are required to demonstrate, especially in order to achieve the higher A level grades. The nature of critical thinking outcomes as presented in the A level specifications for each subject will be examined in each case study. However, it is in the context of the pedagogical choices made by the teacher in an attempt to enable students to address the critical thinking outcomes required by the A level course that Critical Thinking (CT) as a pedagogic process is examined, and where Paul's model in particular is featured.

Overall, I show that across all three subjects in this study teachers are engaged in a process of interpreting and translating at several levels: the nature of the subject; the requirements of the A level specifications; and Paul's Critical Thinking framework. However, these three do not assume an equal weighting, and I suggest that it is the demands of the A level which are the primary concern for the teacher and as such are a key influence on how each teacher interprets, selects and implements features from Paul's Critical Thinking model to inform the pedagogic choices they make in their A level classes. As such, differences amongst the teachers in how they draw on the Critical Thinking model will be driven to high degree by the nature of the disciplinary demands made by their respective A level. However the role of personal theories brought to bear on teachers' perspectives on Critical Thinking is also

apparent in the data, especially in chapters five and six. As a result, Critical Thinking as represented in the practice in these case studies does not appear to be a fixed body of knowledge or even a fixed way of knowing, but is itself part of a more complex interplay between the nature of the subject; how the subject is re-contextualised through the requirements of the A level specifications; the challenges such requirements present students; and pedagogy - all of which are mediated by the teacher.

Finally, given the heavy focus on language and discourse data in all three case studies, details of the conventions adopted in relation to transcription and the use of transcript extracts in the subsequent chapters are outlined in the table below.

Transcription convention (Jefferson, 2004)	Usage
( )	Non-transcribable segments of talk.
(unclear)	Uncertain transcription. Words within parentheses indicate transcriber's guess.
(( ))	Paralinguistic or non-verbal behaviour
…	Brief pauses or hesitations within and between utterances
(. 4)	Numerals in parentheses mark silence, in tenths of a second.
(.)	A full stop in parentheses indicates a micro pause less than 0.1 second long.
[	Left square brackets mark the start of overlapping talk.
]	Right square brackets mark the end of an overlap
=	Equal signs indicate that the turn continues at the next identical symbol on the next line or that there is no interval between the end of prior turn and the start of next turn.
<u>my</u> book	Underlining indicates marked stress or emphasis.
LISTEN	Capitals indicate increased loudness.
?	A question mark indicates rising intonation at turn completion.
↑	A mid turn sharp rise in intonation.
Conventions tailored specifically for my study	**Usage**
R:	Researcher
T:	Teacher
S1, 2 ,3 etc:	Student
(I) (R) (F) at the end of a line	Indicating a relevant part of an Initiation/Response/Feedback structure (Bloome et al, 2004).
bold italics	To draw attention to particular words or phrases to be discussed further in the analysis.
[…]	Indicates part of an utterance has not been included in a cited extract for reasons of economy or coherence.

Table 3.2 Key to the transcription featured in the data chapters

The appendices include the full transcripts from where the extracts featured in the data chapters have been taken. These consist of 3 teacher interviews, 9 lesson observations and 6 teacher commentaries. The relevant extracts will be highlighted in the full transcripts. Details of where each extract can be located within the wider transcript are indicated at the end of each extract used in the data chapters. Each transcript is labelled with the teacher initial and the data of the recording e.g M. 13.4.13.

3.6 Conclusion to the Chapter

In this chapter I have described how I conducted this research, reflecting on methodological issues that arose. I have outlined the three methodological traditions informing this study that consist of ethnography, case study, and micro-ethnography, with a rationale for such a choice linked to the nature of the research questions I sought to address. I have paid particular attention to the complex nature of my role as a researcher adopting an ethnographic approach in the school where I worked. Short professional biographies of the teacher participants have been included and provide a context against which the data analysis of the next three chapters will need to be understood. I have presented the processes I adopted for data collection with accompanying actions I took to in order to address specific issues resulting from my role as researcher. I have explained the analytical framework adopted, drawing on Eraut (1994) and Ball et al (2012) in the context of the constructivist paradigm of teacher professionalism elaborated upon in the theory chapter (ch.2). In this context, I detailed the analytical procedures I adopted in relation to the data collected. Finally, I gave a short overview of the data analysis as presented in the next three chapters in this thesis which constitute three case studies based on each participant teacher. As such, they constitute, in Woolcott's terms (1994) a description and analysis of their pedagogical practices in relation to Critical Thinking. In the discussion chapter (ch.7) I adopt an interpretative stance, examining findings across all three case studies in the context of the theoretical perspectives presented in chapter two.

Chapter 4 Case Study One

In this chapter I investigate the relationship between M's interpretations of Critical Thinking and the A level specifications for politics and government (Edexcel, 2008) as translated into the pedagogical practices he employs in his A level classroom. The key findings from this data appear to suggest that the curriculum requirements as laid out in the A level specifications for the subject seem to determine the teacher's selection and use of aspects of Paul's Critical Thinking model. In other words, the Critical Thinking model is drawn on pragmatically by the teacher to serve the overriding demands of the A level curriculum, rather than being an overt pedagogical aim in itself. However, of the three case studies presented in this thesis, M appears to have absorbed and infused more comprehensively and systematically the Critical Thinking model and its language into his approach to A level teaching, drawing on several features of Paul's model to develop a set of pedagogical approaches which are examined below. It should also be noted that M embeds his use of Critical Thinking tools within a distinctively discursive approach to teaching. As a result, M appears to be engaged in a process of blending his interpretation of Critical Thinking along with his interpretation of the A level specifications to produce a particular 'way of doing A level politics' which, it could be argued, lends itself to a liberal democratic view of education, as referred to in chapter two (Winch, 2006), fostering opportunities for associated dispositions or traits such as student autonomy and the pursuit of curiosity. Nevertheless, it appears that such claims for autonomy and intellectual curiosity may need to be understood within the wider curriculum and institutional constraints at play within the context of the A level classroom.

The case study is divided into three parts. Firstly, I provide a short overview of the data included in this analysis including the context of the lessons which constitute the main body of the data. I then draw on the empirical data in parts two and three: in part two I elaborate upon M's own interpretation of critical thinking outcomes in relation to the A level specifications for government and politics (Edexcel, 2008). It is these, I argue, that inform his interpretation of the Critical Thinking model and his translation of that interpretation into pedagogical practices he employs in the classroom. Part three, which is the substantive part of the chapter, therefore, examines such practices, with particular attention paid to specific aspects of the Critical Thinking model introduced in chapter two including: the use of 'the

Elements of Thought' (Paul & Elder, 2006, p.57) as a means of engaging with propositional content; the use of 'Fundamental Concepts' (Paul & Elder, 2006, p.103) as an organising tool to support his students' development of analytical skills; and the Intellectual Standards (Paul & Elder, 2006, p.87) to provide a focus for peer and self-critique of the written outcomes required by the A level specifications. In addition, the role played by the discursive culture M has fostered in his classroom in contributing to his students' ability to meet the critical thinking outcomes as prescribed by the A level specifications will be examined.

4.1 Data

The main content to be analysed for this chapter is drawn from the talk from the observations of three 45 minute Year 13 A level politics lessons taught by M between early March and mid- May, 2013, with the A level exam due to take place in June, 2013. Lessons observed during the research were part of the A level unit on the politics of the USA. The three lessons covered the following topics (for further detail of the lesson structures see appendix F).

Observation one (M.11.3.13): The key features of Fiscal Conservative ideology in the USA.

Observation two (M.26.4.13): Peer critique of a student essay: 'Why has the impact of professional lobbyists on policy-making in the USA been controversial?' This was followed by class work on the relationship between the Senate and pressure groups in the USA in preparation for an exam essay question.

Observation three (M.13.5.13): Race and the US constitution which was introduced as a new topic.

This lesson observation data was supplemented by other sources of data as outlined in the methodology chapter (ch.3). The data for this case study therefore consisted of:

- Transcribed talk from audio recordings of the three lessons.
- A video recording of the three lessons providing data to analyse, where appropriate, the physical context of the classroom, student organisation and groupings, teacher positioning, and the use of resources.
- Lesson resources including the course textbook *US Government and Politics* (Storey, 2007); and the teacher's PowerPoint resources.

- Transcribed talk from two of M's own commentaries on his lessons, the recordings of which he watched with me three to four days after the original lesson (M.15.3.13; M. 28.4.13)
- Transcribed talk from M's interview that had taken place prior to lesson observations (M. 25.2.13).
- A Level specifications in use at the time of the research (Edexcel, 2008).
- Resources from the Critical Thinking Foundation: The Thinker's Guide to Intellectual Standards (Paul & Elder, 2008a).

4.2 A Level Politics and Critical Thinking Outcomes

In this section, I examine the links between critical thinking outcomes as presented in the A level politics specifications both in terms of the stated aims of the course and as indicated in the A level assessment objectives (AOs). In both cases I will introduce M's own interpretations and signal how these appear to relate to Critical Thinking processes, which will frame the more detailed analysis of classroom data in part three of this case study.

The A level politics exam specifications make an explicit reference to Critical Thinking, stating that the aims of the course include 'to develop a critical awareness of the nature of politics and the relationship between political ideas, institutions and processes' (Edexcel, 2008, p.9) and 'to encourage students to develop their capacity for critical thinking, to see the relationships between different aspects of government and politics and to perceive their field study in a wider perspective, including some comparisons with other political systems' (Edexcel, 2008, p.10). Critical thinking, as expounded here, is clearly located within the subject area of politics, but could be said to lack any precision or clarity in terms of how this might be operationalised. Indeed, the mere fact of stating such skills as desirable or required outcomes in a document is not sufficient in itself to lead to translation into a practical pedagogy which would foster such outcomes in the classroom, as indicated in the Introduction (ch.1) and the theory chapter (ch.2). M's own articulation of what he understood Critical Thinking to be in the context of A level politics indicates a process of 'interpretation' (Ball et al, 2012) as he is able to express his understanding in very particular terms, illustrated by examples and counter examples. As such, M's articulation suggests a personalised operational understanding beyond the definition in the specifications, with its associated implications for teaching, as will be examined in the extract

below taken from M's interview**.**

Extract 1

```
1 M: I think it [Critical Thinking] would be an ability for… sort of… to
2 relate that mass of evidence [content] to...to... particular concepts
3 to show that they can think politically=
4 R: =mmm=
5 T: =em so if you're...you're looking at an issue such as gay
6 marriage in America, you're not analysing necessarily the rights
7 or wrongs of it, you're not arguing the ethical or moral case,
8 it's about looking at the significance of the issue in elections,…
9 em using it to illuminate how the Supreme Court  works, for
10 example em ...looking at it… em… to see how issues…er … how
11 minority issues can become mainstream issues through a variety of
12 political processes  and mechanisms. Em then…so, what I would
13 then hope students are able to do is to … em …use that…use a
14 variety of  er…of ...of case studies  and different forms of
15 evidence in order to make much wider judgments about the nature
16 of the political system and  how it's working.
```

(Appendix G: M.25.2.13, p.227)

Within this extract M shifts independently from an explanation of what he thinks 'thinking politically' is in lines 1-3, that is relating evidence to particular concepts, to what students should *do* in the context of the exam in lines 13-16 which, in this case, is to adopt an empirical approach to sources of evidence to support an evaluative argument on the nature of the US political system. Thus M appears himself to be juxtaposing critical thinking as outcome with Critical Thinking as process, by generating his own internalised understanding of the types of thinking required by the exam, and then to envision it in terms of what students specifically need to be able to *do*. This is a process he replicates in terms of the A level assessment objectives (AOs).

The assessment objectives for the A level politics specifications serve to add a greater degree of clarity and precision to what is required in 'Critical Thinking' terms. As shown below, the assessment objectives appear to follow the standard division for assessment objectives at A level in terms of knowledge and understanding of defined content (AO1); higher order skills (see chapter two for a more detailed discussion of Bloom's taxonomy and Critical Thinking) (AO2); and requirements in terms of the written outcomes expected (AO3).

Extract 2: A level specification Assessment Objectives

> *AO1: Demonstrate knowledge and understanding of relevant institutions, processes, political concepts, theories and debates.*
> *AO2: Analyse and evaluate political information, arguments and explanations, and identify parallels, connections, similarities and differences between aspects of the political systems studied.*
> *AO3: Construct and communicate coherent arguments making use of a range of appropriate political vocabulary.*
> (Edexcel, 2008, p.8)

A closer analysis of the language of these objectives would indicate that aspects of Critical Thinking as featured in chapter two permeate all three with reference to conceptual and theoretical understanding (Lipman, 2003; Paul & Elder, 2006; Land et al, 2008; Nosich 2008); analysis and evaluation of alternative perspectives (Seigel,1988; Krathwohl & Anderson, 2001; Tsui, 2002; Lipman, 2003; Paul & Elder, 2006); and the production of coherent written argument (Fisher, 1988; Toulmin, 2003; Andrews, 2009; 2015). M's interpretation of these requirements were evident in his interview where he frequently referred to the 'quadruplet' of the understanding of a wide knowledge base, analysis, evaluation, and argument, as indicated in the extract below. An analysis of this extract suggests two distinctive features: an elaboration upon the specifications, by introducing what M perceives as a sequential or 'progressionist' relationship; and secondly, the status of the A level exam as a set of uncontested, non- negotiable requirements.

Extract 3

```
1 R:What is it that…that's the distinctive feature of the A level
2 course in politics?
3 M: Em, I think it's …er it's a... er ..a very wide ranging body of
4 knowledge that students need to build up in the first
5 inst…instance, and then they need the ability to …em to… to
6 analyse that information… em...in order to create persuasive…
7 persuasive [arguments
8 R: mm]
9 M: and so draw drawing from… from that analysis they then need to
10 be able to construct sustained [arguments.
11 R: em...em]
12 M: in essays in order to evaluate different… different… em
13 …opinions for example on the extent of a prime minister's powers.
```

(Appendix G: M.25.2.13, p.226)

The relationship between the four distinct elements of knowledge, analysis, evaluation and argument in the A level as presented by M are indicated through indexical items of sequence such as ' in the first instance' (l.4-5); 'and then' (ll.5 & 11); 'in order to' (l.6); and 'they then need to' (l.9). As a result, M appears to present his understanding of the assessment objectives as a clear progression whereby one process is predicated on another in a fixed sequence. In addition, the repetition of 'need to' in lines 4, 5 and 9 in relation to the cognitive skills students are required to display serves to reinforce the absolute and uncontested status of the A level exam. An added feature to the status of argument in the A level exam of relevance here is the synoptic dimension clarified further in the specifications which state,

> *Synoptic assessment is incorporated into units 3 &4 through the assessment of synoptic skills. These skills are based on the essential character of politics as an arena of debate, discussion and contending belief*' (Edexcel, 2008, p.13)

In terms of the unit M was teaching whilst participating in this research, synopticity is understood in terms of '*an ability to demonstrate an understanding of the extent of debate and disagreement over the nature, development and workings of the US political system.*' (Edexcel, 2008, pp.48-49). M's interpretation and operationalisation of this for his students is indicated in his commentary on lesson one,

Extract 4

```
1 M: Well it's [argument] one of the key skills in politics ...there's
2 ...there's one of the marks for AO2 is about synopticity so being
3 able to think through...you know...er a political issue from the
4 perspective of a Conservative and then of a Liberal in the context
5 of American politics so it is something that…you know...I've made
6 quite explicit to students it's a skill they need to develop.
```

(Appendix K: M.15.3.13, p. 263)

As in M's interpretation of the assessment objectives, M's understanding of synopticity includes an articulation of what students have to *do*, as indicated in lines 3-4, as well as his claim that it informs his teaching through making it 'quite explicit to students.' In fact, as will be shown later, it is the synoptic element of the A level which appears to present particular difficulty for his students. Indeed, extracts 3 and 4 above are of significance as they appear to signal a frame within which the detailed analysis of M's Critical Thinking pedagogical practices can be understood: securing authentic understanding of factual information with a constant pedagogical 'eye' on the need for analysis and the generation of argument; and a fluency in terms of a conceptual understanding of issues from different political perspectives. It will be shown how this framing is played out across a series of Critical Thinking based pedagogical actions undertaken by M in part three below.

To conclude this section, it could be argued that critical thinking outcomes in A level politics, as explored here from M's interpretation of the A level specifications, takes the form of conceptual understanding, analysis, and evaluation which are rendered by the exam into the rhetorical mode of written argument. It is the translation of this interpretation into Critical Thinking pedagogical actions to support his students' ability to meet these exam requirements that will be the focus in the next part of this chapter.

4.3 Critical Thinking and Pedagogical Practices

In this section I draw on illustrative examples from M's lesson observation data to examine how he adapts specific features of Paul's Critical Thinking model to support his students in meeting the critical thinking requirements as he has interpreted them from the A level

specifications. These include: the use of the 'Elements' as means of analytically engaging with new propositional content; 'Fundamental Concepts' to support analytical reasoning; and the 'Intellectual Standards' as a set of criteria to support the development of coherent written essays. However, beyond the Critical Thinking tools or structures he deploys, there also appears to be a commitment by M to a discursive approach to his teaching, which could be indicative of a theoretical link between socio-constructivist approaches to pedagogy and some conceptualisations of Critical Thinking, as explored in the theory chapter (ch.2). This will be elaborated upon more fully in the discussion chapter (ch.7). Nevertheless, whilst there may be evidence to suggest that M's teaching lends itself to a liberal 'opening up' of education, supporting a degree of student autonomy (Winch, 2004; 2006), this is very much to be seen within the constraints imposed by an exam based curriculum. Indeed, as will be shown elsewhere in these case studies, where student autonomy of thought appears to rub up against the demands of the exam syllabus, it is the exam syllabus which prevails.

4.3.1 Supporting Students' Analytical Engagement with Factual Content

As was indicated above, analytic and evaluative argument is a clear critical thinking outcome required by the A level politics specifications. This emphasis appears to have informed M's approach to the organisation of his programmes so that it has become an established practice for his students to complete reading and making notes from the textbook prior to lesson, to enable lesson time to be focussed on developing understanding preceding the skills of analysis. This is illustrated by an episode in observation one. Prior to the lesson, students had read and made notes on a section from the textbook (Storey, 2007,pp.175-188) on the ideological positions of Fiscal Conservatives and Social Conservatives within the US political system. At the start of the lesson, students were given a series of questions to clarify their understanding. The questions used in this phase of the lesson were based on the Critical Thinking model's 'Elements of Reasoning'. As referred to in chapter two, according to Paul's conceptualisation of Critical Thinking, all reasoning can be reduced to its core constituent parts, as highlighted below,

> ' Whenever you are reasoning, you are trying to accomplish some **purpose,** within a **point of view**, using **concepts** or ideas. You are focused on some **question**, issue or problem, using i**nformation** to come to **conclusions** based on **assumptions**, all of which have **implications. '** (Paul & Elder, 2006, p.57) [my emphases]

These 'Elements' were translated into question prompts by the teacher on the belief system of Fiscal Conservatives (see fig.4.1 below) based on what students had understood from

the textbook. The prompts in red are based on the Elements of information, conclusions, and implications: red signified questions all students must address; and the green for further extension, requiring more abstract and conceptual thinking around the Elements of purpose; assumptions; concepts; and points of view. I should add that the language of these 'Elements' did not feature in the textbook and therefore it was not possible for students to answer these questions directly from the text, but required a degree of interpretation on their behalf.

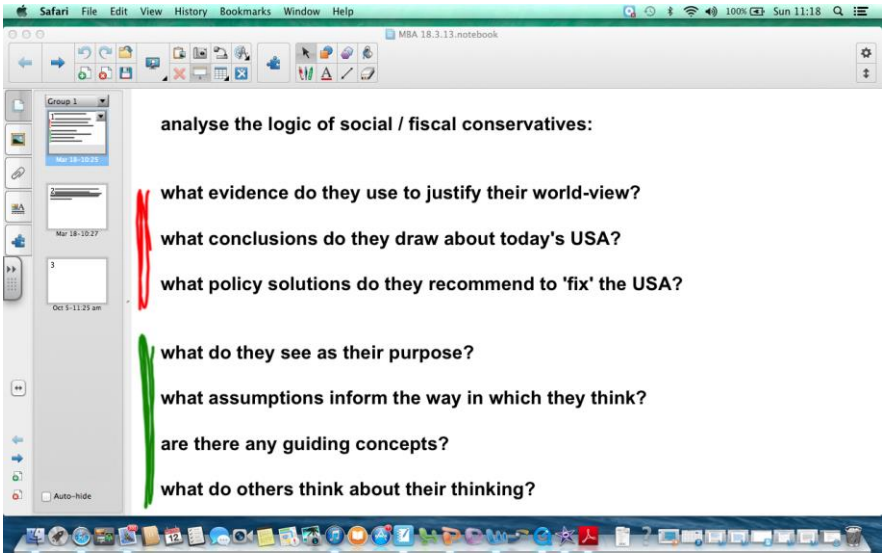


Fig. 4.1 Elements of Reasoning lesson resource

An examination of M's instructions for this task indicates that whilst there is a focus on clarifying understanding, there also appears to be at the same time a move towards developing analysis.

Extract 5

```
1 T: I want you to clarify their [Fiscal Conservatives] beliefs…Can
2 we move back around where we were, okay, ten minutes I want you to
3 clarify what their beliefs are go through the same questions  okay?
4 And really get to grips…I...I want you to…to pick up this idea of evidence
5 what idea, what evidence would they pick up on to justify their world
6 view, okay?  That...that's one of the keys...keys to everything((Students
7 move around to work in different in pairs/groups))(21)
```

(Appendix H: M.11.3.13, p.234)

Indexicals of 'clarify' and 'evidence' seem to reveal M's pedagogic intentions in relation to supporting specific critical thinking outcomes, as will now be explained. The repetition of 'clarify' in lines 1 and 3, along with 'really get to grips with' in line 5 highlights the purpose M appears to attribute to these questions in securing student understanding. However, the repetition of 'evidence' in lines 5 and 6 indicates a further requirement, asking for evidence Fiscal Conservatives would draw on to support their view. 'Evidence' here could be said to

constitute a contextualised alternative for the element of 'information' but information that is used, perceived, drawn upon from a particular perspective. M appears, therefore, even in a 'clarification' task to be looking forward to analysis and evaluation where evidence will be needed for the justification of a point of view. In other words, it could be suggested that propositional knowledge, and the way students are being asked to develop that propositional knowledge is being structured through the use of the Critical Thinking Elements in a way to support *potential* analysis and argument as required by the A level examination. This approach is elaborated upon further by M is his commentary on the lesson,

Extract 6

```
1 M: I think this is the advantage of using the Critical Thinking
2 model here em…just because it gets the students to unpick the
3 whole package of you know...the…the whole system of beliefs
4 because it would be very easy just to describe the beliefs
5…em…but what the Critical Thinking model does is …is give
6 students a way of really what underlies them…so...you know…I'd
7 expect then that students in their essays would be able to recreate
8 that set of views when arguing what they…they [Fiscal
9 Conservatives]actually believe in.
```

(Appendix K: M.15.3.13, p.263)

An analysis of the extract reveals a juxtaposition by M of 'describe the beliefs' (l.4) with 'what really underlies them' (l.6). In other words, he presents a contrast between a surface understanding of what those beliefs are said to be through description with a deeper breaking down or 'unpicking' (l.2), or what might be termed analytical understanding of such beliefs. In this respect it could be argued that although dealing with relatively new content, M draws on the Critical Thinking Elements with an eye on developing early on an analytical understanding with a view to eventual argument construction, as indicated by his move in lines 7 and 8 from students' understanding of a particular position to how they would be expected to use that understanding in essay writing and argument production. In other words, he seems to be making use of a Critical Thinking tool in specific way to support students in working towards the critical thinking outcomes required by the A level exam. The extract below taken from an extended interaction between students and teacher from the same lesson is illustrative of the nature of students' engagement with propositional content generated by the 'Element' questions. This appears to be supported by an analysis of the extract, based on Eggins & Slade's framework (1997) as outlined in chapter three, which serves to reveal what could be termed as embryonic forms of argument in terms of the 'moves' within the student's response, as well as in terms of identifying specific indexicals of

reasoning.

Extract 7

```
1 T: So, what, F, what's informing their world view?
2 S2: We said that they, basically, they believe people should be given the
3 freedom of what decision to make in their best...in their own best
4 interest =
5 T: = Right, yeah =
6 S2: = Because then that way they can make the best decision because
7 as we can see when government interferes
8 T: Yeah
9 S2: Then things go bad such as the deficit and then this can back turn,
10 so if the people are given the choice, then they will act in their best
11 interest and [the economy
12 T: Right] you know how the Social Conservatives say that man is like led
13 by his selfish [desires
14 S2: yeah]
15 T: what would ...em...Fiscal Conservatives say about the status of
16 man?
```

(Appendix H: M.26.4.13, p.235)

The student's answers address the first two questions on the board (see fig.4.1 above):

- What evidence do they (Fiscal Conservatives) use to justify their world view?

- What conclusions do they draw about today's USA?

The answers appear to be presented, not as a set of disconnected assertions, but rather as a chain of reasoning with a momentum of its own, not reliant upon the teacher. Indeed apart from line 1 where the teacher initiates the exchange, the teacher's contribution appears to be fulfilling a registering function providing encouragement for the student to continue with a confirmatory 'right' or 'yeah' (ll. 5, & 8) before taking the discussion to a further philosophical level in lines 12-16. As will now be illustrated through further analysis below, embedded within this student's talk generated by the Elements task appears to be an embryonic form of reasoning commensurate with the rhetorical mode of 'argument' as required by the A level exam.

In response to the teacher's opening question (l.1) the student produces an extended response within which there are several moves indicative of argument development, as will now be explained. The student responds to the question with a claim attributed to Fiscal Conservatives (ll.2-4) which is then enhanced with reasons to support the Fiscal Conservative position as indicated by the conjunction 'because' (ll. 6-7). The chain of reasoning is subsequently developed in line 9 as indicated by ' then' with another 'and then' which is further elaborated upon with the use of an example 'such as the deficit'. This chain is extended further in line 10 leading to the concluding move, indicated by 'so', resulting in a

summary position of the Fiscal Conservatives in the form of hypothetical 'if….then' reasoning (l.10).

Whilst this is not a tightly structured, coherent argument, the context here is one of students developing their thinking as they talk their way through their understanding of relatively new content to them in response to the 'Elements' questions set by the teacher. Yet, even within this situation, there appears to be evidence of framing student thinking within the context of argument.

To summarise, whilst M recognises the need for students to secure an understanding of factual content, such content, it seems, barely has the time to remain 'factual' per se. As indicated in the detailed linguistic analysis above, M's pedagogical approach to clarifying that understanding through his use of the Element question prompts in the lesson served to nudge it towards an analytical understanding with a view to its contribution to formulating an argument. In other words, M has drawn on a feature of the Critical Thinking framework to support his students in developing critical thinking outcomes as required by the exam. Indeed, what this episode and M's commentary appear to signal is M's explicit foregrounding of analysis and argument in his approach to teaching which will be reinforced through his use of another feature of the Critical Thinking model: 'Fundamental Concepts'.

4.3.2 Developing Analysis by Teaching through Concepts

The role of 'Fundamental Concepts' as a feature of one of the Elements in the Critical Thinking model was referred to in chapter two, (see p.26 above) (Paul & Elder, 2006; Nosich, 2008). M appears to draw explicitly on this feature of the Critical Thinking model to inform an approach to his teaching to support his students in developing a particularly difficult critical thinking outcome required by the exam, notably the breadth of analysis to address the demands of synoptic questions. As was outlined above, the A level specifications refer to the concept of synopticity requiring students 'to demonstrate an understanding of the extent of debate and disagreement over the nature, development and workings of the US political system.' (Edexcel, 2008, pp.48-49). M clarified in his interview that the synoptic questions were those which provide opportunity for students to demonstrate the skills required for the top grades. In Critical Thinking terms, synoptic questions from the exam specifications function as a 'central question' or 'unifying question', whereby a course in any discipline or subject 'has *a central question that it revolves around. It is the unifying question and everything in the course fits into that question. The way to*

understand every item in a course is to see how it all fits together, is to understand it in terms of that central question.' (Nosich, 2008,p.109).

It is in relation to developing this breadth of analytical understanding that 'Fundamental Concepts' are seen to have a role to play in Paul's Critical Thinking model,

> *' By using concepts in reasoning, we mean general categories or ideas by which we interpret, classify, or group the information we use in our thinking' (Paul & Elder, 2006, p.59)*

In other words, from a Critical Thinking perspective, these concepts constitute the central ideas within an area of study. They are used to explain or think through a wider body of questions, problems or information, and they therefore operate as an organising tool. As such, '*fundamental and powerful concepts should constantly return throughout the course as part of the explanatory context whenever new material is introduced'* (Nosich, 2008, p.106). Indeed, M's interpretation of fundamental concepts and their role in supporting synopticity within the context of his A level course , as featured in his interview, appears to echo the descriptions of Paul and Nosich above,

Extract 8

```
1. M…the concepts structure the thinking throughout the course and...and
2 structure, most importantly, structure the response to synoptic
3 questions which otherwise students really struggle with because there's
4 an overwhelming mass of information.
```

(Appendix G: M.25.2.13, p.230)

M elaborates further in his interview on how his interpretation of fundamental concepts is translated into practice.

Extract 9

```
1 M: Em so you…I've...I've drawn up a kind of concept map for politics which
2 [includes
3 R: right]
4 M: Em…well it's based around the ideas of power, representation,
5 accountability, democracy, representation, pluralism, have I said
6 accountability? Rights and [participation
7 R: right=]
8 M: =and so I.. I try to be quite explicit with sharing that with
9 students and so they can build up their own conceptual framework,
10 so by the time they're in Year 13…em … then they're ... you
11 know…able to perform their own analysis and if we're talking
12 about, I don't know, say something like  why…er… how
13 significant is Congress, then immediately there's so many angles
14 that students can go down and the concepts provide a sort of ..
15 er… a structure for making coherent all the evidence (they've)
16 built up about both case studies and…and procedural evidence.
```

(Appendix G: M.25.2.13, p.227)

What appears to be significant in this explanation, later borne out by observation data below, is that M shares systematically and explicitly with his students the concept map, as referred to in line 8, so that his students, over time, appear to be able to apply them independently, supporting their own analysis (l. 11). In other words he appears to be taking a Critical Thinking based approach, through the use of 'the concepts', to support his students' ability to

meet the critical thinking outcomes required by the A level exam in terms of the synoptic questions.

References to concepts, both by the teacher and by students, were evident across all lessons observed. Indeed, the term 'concept' appears to have acquired a highly contextualised meaning amongst the teacher and students, often referred to with the use of the definite article. This is illustrated by the exchange below where a student independently raised the role of concepts in addressing an exam question (understood collectively by students and teacher as a '15 marker' in line 2) on the influence of lobbyists, which featured in observation two.

Extract 10

```
1    [S puts his hand up] Ok, S?
2    S10: I'm not sure if you can do this in a 15 marker but can you relate
3    it to the concepts...er democracy...?
4    T: Yeah…which…which...which one would you link it back to?
5    S10: Pluralism
6    T: Pluralism, so this…this is an example of pluralism in action, of
7    having…there are multiple action points here, em …but at cost of
8    what?
9    S3: Democracy
10   T: Explain
11   S3: Because of this corruption…money is influencing members of
12   congress' decision, so=
13   S1 = they're not representing the people.
```

(Appendix I: M.26.4.13, p.247)

Indeed, in the commentary of this exchange M highlights further the connection between these concepts and the synoptic dimension of the exam,

Extract 11

```
1 M: So pluralism and democracy are part of the key concepts (.8) and it's also
2 the big synoptic question at the end of that chapter…em about whether the
3 activities of pressure groups are democratic.
```

(Appendix L: 28.4.13, p.265)

What this short exchange may also indicate is how embedded the concepts are in terms of the teaching so that a student can automatically call on them to ask a question. This is developed further in the extended extract below from the same lesson, where an analysis of students' contributions reveals their ability to draw on core concepts with a degree of fluency. Furthermore, it also appears to show how conceptual understanding is blended with developing the skills for synopticity as outlined above, that is understanding an issue from alternative political perspectives within the context of an evaluative argument.

Extract 12

```
1 T: Just on that point about...em ...unaccountable power, what would
2 Conservatives in America say about this? ...Because we've been coming
3 at this from quite a liberal perspective so far [S's hand up).
4 S9: It's part of democracy
5 T: In what way?
6 S9: Because it's allowing a form of participation… because you
```

```
7 can't have democracy without the participation of everyone...because
8 democracy is the ability to have a say in the system
9 T: Yeah
10 S9: So they would argue that this is a way for a collective group
11 …of collective thinking to have their...say.
12 T: Ok, yeah, yeah…that would be a starting point, S?
13 S10: so they would argue…((pen drops, unclear))freedom of speech, so
14 they could use their money to influence what happens in
15 Congress
16 T: so ...so it's just a natural consequence of...of free speech and
17 Citizens United versus FEC* reaffirm that corporations have free speech
18 rights.
19 S5: Can't you argue that there is accountability because of
20 regulations (unclear)
21 T: Yeah...yeah↑that...that is yeah...that is a good argument
22 because essentially it's these corporations that are going to
23 be most directly affected by the laws and so ...you know...you
24 could argue that it's a good thing that they get to shape these
25 laws em…because there's a tradition…there's a free market
26 tradition in America em…which has emphasised that government
27 should be a bit more hands off when it comes to regulating
28 companies, so if regulation is necessary the argument is that
29 it's healthy to have the companies concerned influencing
30 that…that regulation.

* FEC = Family Equality Council: An American civil rights advocacy group.
```

(Appendix I: M.26.4.13, p. 247)

First of all, the core concepts drawn on in this extract include 'accountability' (ll. 1, 19); 'democracy' (ll. 4, 7 & 8); and 'participation' (ll. 6 &7). Students appear to draw on these confidently and fluently, as in lines 4, 6 and 19, not initiated or prompted by the teacher. Indeed, in lines 19-20 the student seems to be developing his own independent line of argument, 'can't you argue that…' drawing on the concept of 'accountability' as to how the Conservatives might justify lobbyists from big companies. It could be argued that at this moment there is a clear convergence of Critical Thinking process and the critical thinking requirements of the exam whereby the student is developing an understanding of a political issue illuminated by a core concept (accountability) and developing a line of argument from a particular political position. In other words, the student is indicating a degree of synoptic understanding as required by the A level specification.

Secondly, the extract also appears to indicate the degree to which 'argument' is embedded into the way of thinking in this class. The term 'argue' appears frequently in the language of the classroom, used by students as much as the teacher, as illustrated in lines 10, 13, 19, 21, 24 & 28. These references also appear to suggest the students' awareness of stance being taken by a particular political perspective, as indicated by attributing position through 'they would argue that' (ll.10,13). However, a shift to the second person 'you could argue' (ll. 19 & 24) could be said to position the student in terms of the exam as author of his own arguments. However, just using the terms 'argument' and 'argue' does not necessarily

indicate the presence of argument, but a more detailed analysis of the extract above does appear to indicate students pursuing a form of deductive reasoning (Fisher, 1988). They may not be articulating it in the formal register of argument but a chain of reasoning is apparent when, for example, lines 4-11 are analysed structurally, as indicated below in table 4.3,

Restructured students' contributions based on lines 4-11	Features of an argument (Fisher, 1988; 2001)
Democracy is the ability for everyone to have a say (l.8)	Reason 1
(therefore) you can't have democracy without the participation of everyone (l.7)	Intermediate conclusion 1
The lobby system is a way for a group to have their collective say (ll.10-11)	Reason 2
(therefore) the lobby system is a form of participation (l.6)	Intermediate conclusion 2
(therefore) the lobby system is a part of the democratic process. (l.4)	Conclusion

Table 4.1 Structural analysis of a student's argument

To summarise, M's approach to 'Fundamental Concepts' serves to provide a further illustration of how his selection and systematic adaptation of a specific features of the Critical Thinking framework appear to support his focus on foregrounding analysis and argument, as required by the A level exam. It has been shown how students appear to have absorbed the key concepts M has identified and made explicit to them, as indicated through students' independent use of them in lessons. It has also been illustrated how they appear to provide a catalyst around which students are able to transform factual information into analysis and interpretation to support the synoptic argument demands of the specifications. A final feature of the model used by M is that of the 'Intellectual Standards' used to support students in producing the written outcomes required by the exam. This provides a final illustration of the teacher seemingly blending the Critical Thinking model with the critical thinking outcomes required by the A level.

4.3.3 Intellectual Standards and Written Outcomes

In observation two, students were asked to peer critique a fellow student's written exam answer in response to an exam question on why the influence of lobbyists in Congress was

controversial. It is in this context that once again M's use of the Critical Thinking model appears to interact with requirements of the A level exam. As will be examined below, M appears to have established a practice of using the Intellectual Standards from the Critical Thinking model whereby students reflect critically on their own written responses to exam questions and in so doing demonstrate an absorption of the 'rules' governing the literacy practices of the A level exam (Lea and Street, 2006). This will now be examined more fully. The structure of the first part of the lesson appears to replicate what M had identified in his interview as an approach to assessment of written outcomes:

Extract 13

1 M: The way I do assessments is em…so students will… students will
2 make notes on a particular section in their textbooks...or from
3 their textbooks… and then they'll bring that in for a lesson and
4 that's ...that's when we really analyse the material in front of
5 us and relate it to…to the concepts. Em … then I'll introduce an
6 exam question .. em students will then apply the knowledge and
7 understanding to the exam question, I'll send them away to go and
8 write that up and next lesson. Then, typically I'll take
9 someone's…em essay, photocopy it for everyone, and then we'll peer
10 assess that...

(Appendix G: M.25.2.13, p.228)

The Intellectual Standards from the Critical Thinking model provide the criteria used by M and his students for assessing their written answers. As examined in chapter two, the Standards referred to in Paul's Critical Thinking model consist of clarity, accuracy, precision, breadth, depth, significance and logic (Paul & Elder, 2006). Whilst such terms can be found either explicitly or implicitly in the A level specifications, what the Critical Thinking framework appears to offer M, which goes beyond the exam descriptors, is materials and activities to unpack what each of those standards might mean in practice. In other words it could be said to offer M a way of operationalising such concepts which serve to put them in sharper relief for him and highlight the need for them to be made explicit in terms of the subject context, as expressed in his interview and also illustrated in extracts 15-17 below.

Extract 14

1. M: … And that's where the Standards become really important
2 because I think...I think it really helps to provide that framework
3 for analysis ... em for what makes good work. And I think that's
4 something I've built up over time by making explicit reference to
5 the Standards em...so ...now I don't really provide any prompting,
6 yet students are, I'd say, ... er are quite skilled now at you
7 know, sort of using the Critical Thinking Standards in order to
8 assess each other's work. So then after that, they get a chance to
9 redraft their work and to put into practice formative comments and
10 then (unclear) hand that in and mark it and give them a summative
11 comment.

(Appendix G: M.25.2.13, pp.228-229)

M's claim in extract 14 that his students have become skilled at this form of assessment of thinking appears to be supported by the illustrative examples from observations below.

4.3.3.1 Intellectual Standard of Precision

M's own operationalisation of the Intellectual Standards in the context of his A level specifications is illustrated below. In observation two, M was making explicit reference to the specific standards from the Critical Thinking model of 'precision' and 'significance' and their relevance for their written answers for the A level exam. Precision was the key standard being used for the 15 mark question assessing 'knowledge and understanding' (AO1) and it is interesting to compare the formal language of the descriptors for AO1 with M's own interpretation, as presented on his A level politics webpage used with his students.

Exam Specifications (Edexcel, 2008, p. 10) AO1	**M's interpretation of AO1 for students (Y13 Politics School Online Learning platform)**
Candidates characteristically: a) demonstrate full and accurate knowledge of political institutions and processes and a sound understanding of political concepts, theories and debates b) produce answers that deploy relevant knowledge to answer the question c) demonstrate clear contextual awareness d) use relevant evidence and, where appropriate, contemporary examples to illustrate points made.	Knowledge and understanding: you will be assessed on how far you use in depth knowledge and use *precise* and accurate examples to support your reasoning. You should be familiar with and deploy appropriate*, precise* political terminology (my emphases).

Table 4.2 comparison of exam specifications and teacher interpretation of AO1

An analysis of the two texts above shows that the term 'precise' does not feature explicitly in the A level specification descriptor yet it has been given prominence in M's interpretation. As will be shown below, M's use of the term 'precise' in the lesson appears to draw on the articulation of precision in the Critical Thinking model, where it is operationalised through such questions as ' Could you be more specific? Could you give me more detail? Could you be more exact?' (Paul & Elder, 2008, p.8). In setting up the peer critiquing task, as presented below, M emphasises the role of precision through his repetition of the term; his intonation; and also though explicating what it means in the context of the specific exam question being addressed, clarifying what must be done and what cannot be done. In addition, the language of obligation and interdiction appears to blend this interpretation of 'precision' with the unassailable status of the exam and the written genres it requires. As a

result, an analysis of this extract appears to highlight that precision, as used by M, does not remain a 'general' term but assumes a highly contextualised meaning.

Extract 15

```
1T: Think about the..er precision  of Z's examples because we said
2 that was..er the the key thing when we're looking at ..em .er
3 pressure groups ok, you've got to be precise in the examples that..
4 that you give, ok? You can't just say that so and so donated money
5 so therefore it had an impact, you've got to explain how that money
6 has an impact, what does that money do? How does it translate into
7 political action? ((Students left to work on the piece individually)).
```

(Appendix I: M.26.4.13, p.245)

The obligation of being precise is underlined through the imperative 'you've got to' (ll.3 & 5) and also through the emphasis in tone given to the term precision and precise (ll 1 &3). To operationalise for students what precision means in the context of the exam question under discussion, he gives a counter example in lines 4-5 of what imprecision would be, followed by examples of what precision *would* look like (ll. 5-7). Furthermore, throughout this section of the lesson, M's questioning and commentary on the points students make in terms of the critique serve to reinforce the key feature of precise examples. In turn, students' critique of the shared exam answer appears to indicate they have become adept in evaluating the strengths and weaknesses of an answer, as illustrated by extract 16 below. However, the extract also serves to illustrate a further dimension to M's use of the Standards, evident across all lessons, which is how his questioning is used to probe students to develop their own thinking with greater precision and clarity. This is particularly revealed through an analysis of the IRF (Initiation-Response-Feedback) structures at play here (Bloome et al, 2008), referred to in the methodology chapter (ch.3),

Extract 16

```
1 T: What about ways to improve? Em…er A what did you think?(I)
2 S6: Em, for the first point I thought he could have ...em made things
3 link to policy making like more explicit(R)
4 T: Explain (F/I)
5 S6: So by saying..because he spoke about revolving doors ... he could
6 have said ..and linked that back like by saying there's ..er concept
7 er constant access to power (R)
8 T: Wha…what do you mean by constant access to power? (F/I)
9 S6: Em.. (R)
10 T: In this particular example with Liz Fowler? (F/I)
11 S6().5)
12 S3: Because I would say that she left politics in a way that she still
13 maintained her influence  [after  (R)
14 T: Yeah]
15 S5: she was there she kept her foot in the [door (R)
16 S3: Yeah]
17 T: Well she's done this a number of times hasn't she because she
18 was...em…what...before she wrote healthcare legislation what...what
19 was her position (F/I)
20 S6: Vice president (R)
```

(Appendix I: M.26.4.13, p.246)

In lines 2-3 the student adopts an evaluative position in terms of identifying a need to be more explicit in the point being made. However, the subsequent teacher intervention forces the student herself to develop greater prevision in her thinking. The IRF structure apparent here and replicated elsewhere across all three lessons (see section 4.3.3.4 'discursive practices' below) is in fact a structure I have termed IRF/I whereby M's response often leads into a further initiation which takes the thinking further forward in the form of an ongoing chain of developing understanding rather than discrete 'IRF' units of teacher-student exchanges. For example, M's requests for the student to 'explain' (l. 4), and 'what do you mean by…'(l.8) are an articulation of the standard of clarity as operationalised by the Critical Thinking model, 'Can you elaborate on what you are saying?', 'Can you give me an example or illustration of your point?' (Paul & Elder, 2008, p.7). This appears to lead to students clarifying and developing their thinking as shown in lines 5-7 and lines 12-15.

In effect, what appears to be happening in this exchange is a double layer of Critical Thinking approaches: at one level, the use of the standard of precision to critique the written answer of a student in relation to the requirements of the exam; and, at another level, teacher questioning holds students to account for the clarity of their thinking in terms of their contribution to that critique. In other words, by engaging in critique, students are also engaged in clarifying their own understanding. This appears to be supported by M's own findings, as revealed through his commentary of the lesson,

Extract 17

```
1 I've found that...that's been the most...the most effective way of
2 getting students to actually enact you know...sort of…their form… their
3 own formative comments from each other and as you
4 see...they're...they're able to correct any misunderstandings or …er…
5 clarifying …any…any outstanding issue.
```

(Appendix L: 28.4.13, p.265)

Indeed, what M appears to be doing here with the Standards, as well as with the Concepts, is developing a shared meta-language with his students to talk about the quality of their thinking, which appears to support them in developing a degree of autonomy over their own understanding and learning. The relationship between this pedagogic rendition of Critical Thinking, metacognition and autonomy will be explored fully in the discussion chapter (ch.7) with reference to Bernstein's concepts of visible and invisible pedagogy.

To summarise, as with the use of the Concepts and the Elements, M has incorporated the Standards from the Critical Thinking model into his teaching to support students in meeting the specific requirements from the A level specifications, notably in terms of producing the

appropriate written formats required. As has been shown above, both teacher and students' use these 'universal terms' such as 'precision' in a highly indexical form, with a shared contextualised understanding of the term in relation to the A level politics exam. Indeed, drawing on the illustrative examples from the all three features of the Critical Thinking model presented here, it could be argued that the language of Critical Thinking has become assimilated into the language and way of working of this class to enable students to develop the critical thinking skills required by the exam. However, I would argue that this goes beyond the influence of 'tools' alone. An additional feature of the teacher's approach to the Critical Thinking tools examined above has been the discursive nature of the tasks M constructs around them. Such practices, blended with a consistent and systematic approach to M's contextualisation of his choice of Critical Thinking tools appears to create a culture with a very defined way of 'being' an A level politics student in M's class. These ideas will now be examined in the final section of this analysis.

4.3.4 Discursive Practices

As shown in terms of the structure of all three lessons used in this data analysis (see appendix F) each one was structured in a similar way to enable students to work in pairs on securing or exploring their understanding of the topic at hand. The structure could be described in terms of 'ebb and flow' whereby a task was initiated by the teacher, students released to work in pairs usually in the form of a discussion, then brought back together for a whole class feedback discussion, to surface and clarify any misunderstanding and also to develop understanding further. This systematic 'ebb and flow' structure replicated in all observations seemed to allow students the space and time to 'think' their way through material autonomously and appeared to afford M the opportunity to tailor his role according to the needs of individuals, pairs, or groups.

During the paired work phase the teacher actively circulated and supported individual pairs in their discussions (see fig 4.2 below)

Fig 4.2 Teacher support during paired activity

An analysis of interactions across all three lessons whether in paired activities or as class activities reveal with a high degree of consistency the following two features: firstly, teacher led IRF/I structure where the teacher feedback is combined with a further initiation to reopen a further interaction, thus developing a chain of thinking which appears to develop further student understanding, as referred to above (p.91); and secondly, a change of roles whereby students also initiate and/or prolong exchanges through their own contributions which serve to elaborate, extend or enhance previous moves by the teacher or others in the exchange (Eggins & Slade, 1997). It could be argued that this represents evidence not just of student engagement with the content but also a degree of criticality, if authentic student questioning and discussion are seen as a manifestations of a pedagogy supporting Critical Thinking, as referred to in the theory chapter (see p.30 above).

These features are illustrated in extracts 18 and 19 below from the third observation generated by a 3 minute clip students had watched taken from the Michael Moore film *Bowling for Colombine* (see appendix F). This was part of a lesson introducing a new topic on race and the US constitution. The clip presented a satirical whistle stop tour through American history from the arrival of the Pilgrim Fathers and suggested ways in which racial fear had shaped US attitudes, especially in relation to gun ownership.

Extract 18 below serves as a further illustration of M's use of the IRF/I structure where the feedback merges into an opportunity to take the discussion further forward, by putting responsibility back onto the student to develop his or her thinking further. In other words, M's feedback does not close down the exchange, but provides further initiation that keeps the

thinking moving forward. In terms of the A level specifications, it will be shown that this approach to 'taking thinking forward' by M is very much linked to ensuring students develop and articulate their understanding of the different Liberal and Conservative perspectives, and thus supporting students' synoptic skills.

Extract 18

```
1T: Ok, let…let's talk through, let's talk through em…F., can
2 you start us off, whose...whose perspective do you think that was
3 from? (I)
4 S1: Liberal(R)
5 T: Liberal, why? (F/I)
6 S1: Because they're showing the white people as being...against…the
7 black people's rights, the minority's rights, so they're trying to
8 protect the minority's rights by saying that they didn't have them (and
9 the NRA* are taking them away from them(R)
10 T: Right, ok..em..so both the NRA and the Klu Klux Klan were
11 taking away the rights of African Americans, ok…em...Why↑ why
12 ↑Why do Liberals tend to emphasise that, the role of white people
13 in taking away the rights of minorities (F/I)

*NRA = National Rifle Association
```

(Appendix J: M.13.5.13, p.254)

M's initial initiation elicits (l.1) a single answer which is met by a teacher move seeking clarification from the student (l.5) which then leads to a more developed elaboration of the Liberal position in lines 6-9 by the student. This is then taken further by M's subsequent question. However, the next stage in this episode, below, illustrates students taking a greater lead in the development of the answer, with the teacher's minimal feedback of 'yeah' punctuating the response serving to affirm the student's reasoning and encouraging him to continue.

Extract 19

```
1 T: ….Why↑ why ↑why do Liberals tend to emphasise that,
2 the role of white people in taking away the rights of minorities?
3 S1: There's the wealth=
4 S2:=I think they blame the inequalities on
5 T: [yes
6 S2: the] mistakes of the superior whites before where er...er...um...
7 because they thought themselves of the higher [status
8 T: Yeah]
9 S2: Looking down on African Americans
10 T: Yeah
11 S2: It created this idea that…it kind of (( increasing excitement))
12 etched into people's minds that yes, African Americans are a
13 minority group and they are [(should)
14 T: right]
15 S2:  be treated like that so it just passed down like that
16 T: Ok, yeah, and S ((S has had his hand up))
17 S3:(unclear) Tyranny of the majority  so...the majority took over
18 the minorities, so the minority found it hard to go against so
19 they had to go with it
20 T: Right
21 S3: And the constitution developed over the years to
22 adapt to that
23 T: And in the view of the Liberals who...what...what...em
24 what played the key part in taking apart this
25 segregated...discriminatory...em…society?
```

(Appendix J: M.13.5.13, p. 254)

M's initial question positions the discussion in the context of a Liberal perspective. S1 starts to respond (l. 3) but S2 interrupts to take the response in another direction which continues through lines 4-15 made up of several moves. He develops his original proposition (l.4 &6) through the use of a justification as indicated by 'because' (l.7) which is then extended through the introduction of further information (ll.11-13 & l.15). S3 observes the convention of having his hand up to indicate he wishes to contribute which he does when M signals to do so. His extended contribution appears to build on the explication given by S2, by attributing a conceptual label to the phenomenon S2 had described, 'the tyranny of the majority' which he then extends through additional information (ll. 17-22). The teacher then builds on this contribution to ask a question, taking the exploration of the Liberal position further forward. The participation structures evident in the exchanges analysed above appear to indicate a culture within the classroom which encourages students' intellectual engagement in the topic at hand. Such engagement seems to result from the teacher's stance of responding to students' contributions with further questions or probing; as well as students also demonstrating a readiness and ability to ask questions, to initiate and take forward discussions to an extent independently of the teacher. As such, the teacher is demonstrating some of the facilitative pedagogical practices to support Critical Thinking processes as identified from the literature in chapter two, that is: teacher questioning or probing for depth or breadth by asking for clarification, evidence, and seeking assumptions; encouraging discussion and student questioning (Bailin et al, 1999b; Miri et al, 2007). Indeed, such participation structures appear to be supported by the physical environment created for the lessons. Regardless of where the classes take place, students at the start of each lesson were observed consistently to reform the tables to create a large table around which they worked 'seminar' style, as shown in the image below (see fig.4.3). As such, the practice of debate and discussion seems to be 'held' in the layout of the classroom (Bloome et al, 2008). Indeed, M commented on this explicit aim to develop a discursive classroom culture when commenting on the lesson layout,

Extract 20

```
1 M: And we discussed the rationale for that [seminar style lay out] at
2 the start of the year ...that the lesson is explicitly discursive in
3 style and you're...you're discussing with each other not just with me
```

(Appendix K: M.15.3.13, p.262)

Fig. 4.3 Seminar classroom layout

However, to conclude this section on discursive practices and Critical Thinking, it should be noted that such student led discussion appears to be confined by the exigencies of the lesson which, in turn, are determined by the requirements of the exam. As such, the teacher assumes the role of 'orchestrator, quite literally, where M appears to be physically conducting the discussion as represented in figure 4.3 above. The role of 'orchestrator' is also illustrated in the way he appears to direct what might be construed as 'errant' student contributions to what is the focus at hand. This is illustrated by the episode below which comes from lesson one examining the views of Social and Fiscal Conservatives. Two students in the discussion phase in the lesson were discussing an article they had read on the development of fracking in the USA.

Extract 21

((Students engaged in a paired discussion as teacher approaches))
1 S10: 'Cos basically, with the amount of emissions and stuff produced,
2 that's gonna affect our demand for oil
3 S11: That's what Rommney was [arguing
4 S10: Sir, I was] reading this article about in 2020 America will be
5 completely self sufficient in oil which basically means that they're=
6 T: =Because of fracking?
7 S10: [yeah
8 T: yeah, yeah]
9 S10: and they said that they're gonna basic… they're not gonna care
10 about the Arabs at all because obviously… the main reason they have all
11 these terms and stuff with the Arabs is for the oil but as soon as
12 they're self-sufficient they're like, you guys can go to hell
13 T: Yeah..yeah
14 S11: They're...they're the 6th biggest exporter of oil, right?
15 T: Yeah, already, yeah...[so
16 S10: So] in 2020 they will be completely self-sufficient
17 T: mmm
18 S10: So basically it means they don't need any of the Arab
19 countries.
20 T: And what did that article argue about why that revolution in
21 fracking had happened?
22 S10: I can't remember, I read it a really long time ago
23 T: Okay, because there is an argument…you know how like you...you know
24 about fracking

```
25 S10: [Yeah
26 T: a new] technique to get oil out of the ground, that's been led by
27 led pretty much by private companies so Fiscal Conservatives would use
28 that as an example of what free markets economics can do ...yeah…and
29 who interferes with that? Who's stopping them from expanding their oil
30 production even further?
31 S11: Social Conservatives?
32 T: No, not Social Conservatives
33 S10: the environmentalists
34 T: The environmentalists ...
```
(Appendix I: M.11.3.13, p.236)

Line 4 shows the student initiating the exchange with the teacher, not asking a question but drawing him into the discussion he had already begun with his partner. Indeed lines1-19 indicate that the two students are very much leading this discussion. The only significant input by the teacher at this stage is the reference to fracking in line 6 which is done as a clarifying move whilst the student is expounding his understanding of the article. The students continue to co-construct an argument on the impact of US oil self-sufficiency on the Arab world (ll. 9-19) with what might be understood to be a degree of passion indicated by 'you guys can go to hell'. However, the teacher does not follow the lead set by the student by elaborating on the argument presented, rather from line 20 the he resumes the more dominant role and in lines 26-28 makes a discursive move to reframe the fracking issue in terms of the beliefs and values of Fiscal Conservatives, which was the focus of the lesson.

In other words, whilst the participation structures examined above could be said to support 'student autonomy', as explored in chapter two, in relation to their engagement with lesson content, there do seem to be some constraints at play which may limit the nature and extent of this autonomy. The relationship between Critical Thinking and the exam is one which appears to be weighted in favour of the exam, as when students move into areas not not relevant to the part of exam being covered by the lesson, these seem to be closed down by the teacher who, ultimately exercises 'topic control' (Fairclough, 1993). Given the proximity of the exam to this series of lessons, and the limitations of time, it may be understandable that the teacher exerts such clear topic control both internally, by clearly delineating when which issues will be explored, or by cutting off anything which is beyond the perimeters of the syllabus. What this does appear to suggest, therefore, is that 'criticality' in a liberal sense, as referred to in chapter two, of allowing curiosity of thought to be pursued wherever it may lead will be constrained by competing forces in terms of institutional factors, in this case the exam requirements.

4.4 Conclusion

In this chapter, I have investigated the relationship between M's interpretation of Critical Thinking and the A level specifications for politics and examined how these combine to translate into specific pedagogical practices he employs in his classroom. Observation data seems to suggest that what the Critical Thinking model provides are particular tools to support explicitly students' ability to develop the skills of criticality in A level politics as defined in the A level specifications. These consisted of the Elements; Fundamental Concepts; and the Standards which have been interpreted by M in the context of his specifications and infused into specific and systematic pedagogical practices and into the language used in the classroom. It was shown how these appear to support the development of students' conceptual understanding; their ability to engage analytically with content; and to produce written outcomes required by the A level specifications. However, the use of the Critical Thinking model is a partial, if significant, feature of his A level pedagogy. In addition to the Critical Thinking model, the data also showed that M structures his tasks so that students not only have the opportunity, but are expected, to work collaboratively to think their way independently through content, and to participate actively in the discursive practices he has established over time.

A key feature from this data is the agency of the teacher, engaged in a complex process of contextualisation, selecting aspects of the body of knowledge presented in the Critical Thinking materials and applying it to the body of knowledge presented in the A level specifications whilst at the same time blending them both with an approach to teaching which is located within a pedagogical constructivist paradigm. Indeed, it is this amalgamation which appears to have created a classroom culture fostering a degree of student autonomy, albeit within the constraints of an exam driven curriculum. As a result, it appears that from this first case study, Critical Thinking is drawn on to inform a way of teaching, rather than being a fixed or autonomous body of skills or knowledge to be taught (Hare, 1995; Flores et al, 2010).

Chapter 5 Case Study Two

In this second case study I explore the relationship between teacher J's interpretation of Critical Thinking and the A level specifications for biology (Edexcel, 2010) as translated into the pedagogical practices he employs in his A level classroom. As will be shown, J's use of Paul's Critical Thinking framework is less comprehensive than that seen in M's case study, although there is evidence that J has developed and enacts his own clearly defined pedagogic conceptualisation of Critical Thinking. Indeed, the key findings from this case study appear to show an interrelationship between three aspects: the teacher's understanding and interpretation of the A level specifications and their associated critical thinking outcomes; the teacher's interpretation of Bloom's taxonomy; and the teacher's metacognitive conceptualisation of Critical Thinking in which he selectively incorporates a specific feature of Paul's Critical Thinking Framework. The unifying feature of these different components appears to be the teacher's agency in synthesising all three into his own approach to A level teaching, informing and informed by strongly espoused pedagogical values (Day, 1993; Elliott, 1993). However, as will be illustrated below, these three components do not appear to play an equal part in directing the teacher's pedagogical decisions as it is the requirements of the A level specifications that are his primary concern. Indeed, it is this imperative that appears to frame J's use of Bloom's Taxonomy and the Intellectual Standards from Paul's model, both of which serve as resources on which he draws pragmatically to support his commitment to a metacognitive approach to teaching. As with M, J has embedded such approaches within a distinctive collaborative classroom culture which could be said to foster the dispositions students require to engage critically with the complex content presented in the A level biology specifications. These will now be fully explored.

The chapter is divided into three parts: firstly, I provide a short overview of the types of data included in this analysis and the context of the lessons which constitute the main body of the data. In part two I draw on primarily interview data to elaborate upon J's bi-partite interpretation of critical thinking outcomes in relation to the A level biology specifications. It is these, I argue, that inform his pedagogic conceptualisation of Critical Thinking as an essentially metacognitive one. Part three, which is the substantive part of the chapter, explores these issues in the context of classroom practice where the following aspects are

highlighted: the difficulties students experience in mastering complex scientific content required by the A level specifications; J's use of Bloom's taxonomy in the context of addressing such difficulty; J's use of the Critical Thinking Intellectual Standards; and finally collaborative practices orchestrated by the teacher to support students' critical engagement with such complex content.

5.1 Data

The main material to be analysed for this chapter is drawn from one interview with J and then talk from the observations of three 45-minute Year 13 A level biology lessons taught by J between early March and mid-May, 2013, with the A2 exams due to take place in June. Full details of the teaching sequences can be found in appendix F. The three lessons used in this analysis covered the following content:

Observation one (J.7.3.13): The topics of dark adaptation and perception

Observation two (J.25.4.13): Individual or paired revision on a topic students had identified as an area of weakness based on feedback from a practice exam.

Observation three (J.9.5.13): Peer testing to check accurate recall of weaker topic areas; application of newly mastered knowledge to exam questions; self-assessment of the quality of the answers based on the exam mark scheme.

This lesson data is supplemented with other sources of data as outlined in the methodology chapter (ch.3). The data for this case study therefore consists of:

- Transcribed talk from audio recordings of the three lessons.
- Video recordings of the three lessons providing opportunity to describe, where appropriate, the physical context of the classroom, student organisation and groupings, teacher positioning, and the use of resources.
- Lesson resources comprising an A level textbook *Salters-Nuffield Advanced Biology for Edexcel A2 Biology (*Edexcel, 2009*)*; and the teacher's whiteboard resources.
- Transcribed talk from two of J's own commentaries on the lessons, the recordings of which he watched with me two to four working days after the original lessons (J.13.3.13; J.29.4.13).
- Photographs of student work produced in the lessons.
- Transcribed talk from J's interview that had taken place prior to lesson observations (J.25.2.13).

- Resources from the Critical Thinking Foundation: The Miniature Guide to Scientific Thinking (Paul & Elder, 2003).

5.2 A Level Biology, Bloom's Taxonomy, and Critical Thinking Outcomes

In this section, I outline how J's interpretation of critical thinking outcomes in A level biology appear to be closely aligned to his understanding of Bloom's taxonomy. I explain how this seems to inform two distinct conceptualisations of critical thinking outcomes which I label ct1 and ct2, and how J relates both of these to his pedagogic interpretation of Critical Thinking as an essentially metacognitive process.

The A level specifications for biology as shown below appear to clarify the specific cognitive skills students are expected to demonstrate:

Extract 1: AS/A2 Knowledge and Understanding (Edexcel 2010, p.11)

This AS and Advanced GCE specification requires students to:

- Recognise, recall and show understanding of scientific knowledge
- Select, organise and communicate relevant information in a variety of forms
- Analyse and evaluate scientific knowledge and processes
- Apply scientific knowledge and processes to unfamiliar situations
- Assess the validity, reliability and credibility of scientific information.

The link between critical thinking outcomes and Bloom's taxonomy (Bloom, 1956; Anderson et al, 2001) in this account is explored more fully in the theory chapter (see ch.2). It is raised here as although the A level biology exam specifications make very limited explicit reference to Critical Thinking in their aims or assessment objectives, the skills referred to above and performance descriptors clearly indicate the role of Critical Thinking issues, such as conceptual understanding, analysis, interpretation, and evaluation of data and conclusions, each of which can be said to correlate with what is traditionally viewed as higher order thinking skills (Bloom, 1956; Paul, 1985; Anderson et al, 2001, see chapter two for a fuller discussion). This is further developed in the grade A/B descriptors that include the requirements that candidates, 'apply principles and concepts in familiar and new contexts involving only a few steps in the argument'; 'interpret, explain, evaluate and communicate the results of their own and others' experimental and investigative activities, in appropriate contexts'; and 'critically evaluate any statements, conclusions or data' (Edexcel, 2010. p.117).

Furthermore, J's own interpretation of the A level biology specifications, as revealed through the language in his interview, appears to be heavily influenced by Bloom's taxonomy which, he explicitly refers to (see extract 3 below). As will be shown, this has implications for his conceptualisation of critical thinking outcomes and, in turn, for his articulation of Critical Thinking as the pedagogical means by which such outcomes are to be achieved. Indeed, in his interview, J demonstrated his own interpretation of the specification requirements whereby he referred to a clear hierarchy of skills based on Bloom's taxonomy, making a distinction between: factual recall and understanding; analysis and interpretation of data; and critical evaluation of an experimental design or protocol.

Extract 2

1 J: So, the distinctive features of my subject are ...em...it
2 can be quite content heavy so there is a fundamental base
3 knowledge that pupils need to have em …sort of …recalling…as
4 the subject is…em very sequence based, a lot of biological
5 systems are …em…a logical sequence of events so pupils need
6 to be able to recall that sequence[…]And they move onto sort
7 of the higher order thinking of it, there's a…em…there's a
8 high mathematical element↑ so pupils need to be able to
9 analyse data↑...em...from experiments (.) They then need to
10 be able to explain that data applying those concepts that
11 they know …em…to known and unknown situations so they
12 give…can be given a context that they haven't come across
13 before but use the knowledge that they have to try to
14 explain why that would happen or suggest mechanisms… And
15 then there's the creative element where genuine
16 experim…experimentation is a creative process where they
17 have to…you have to ((clearing throat)) come up with a
18 protocol that could investigate it and then reviewing it,
19 work out how...you know...analyse that data if it doesn't
20 show the trend wha…why doesn't it and how
21 could you adapt it so … a lot of evaluative skills as well
22 in terms of why hasn't it worked, what would I change?

(Appendix M: J.25.2.13, p.267)

The references to 'baseknowledge' and 'higher order thinking' in lines 2 and 7 respectively do not come directly from the A level specifications, and seem to reflect Bloom's 'lower' and 'higher' order thinking skills (Bloom, 1956; Anderson & Krathwohl, 2001). In addition, J appears to depict a 'progressionist' relationship between these cognitive processes as indicated by indexicals of 'sequencing' such as 'they move onto' in line 6 and 'and then' in lines 14-15. As such, he seems to be presenting A level biology firstly, as a body of knowledge which students need to have mastery of in order to be able to recall with accuracy; secondly a set of 'higher order thinking skills'; and thirdly, as a creative process (l.15), which aligns closely to Bloom's original hierarchy (see ch.2).

Indeed, it is J's reflections on the types of thinking required by the exam specifications that is the catalyst for his own conceptualisation of Critical Thinking as the pedagogical means by

which students are able to meet these requirements. As is illustrated in the following interview extracts (extracts 3 & 4), he makes the distinction between two different types of critical thinking outcomes required by the A level exam: in extract 3, these are presented as the specific types of thinking and written formats required by exam questions; in extract 4, it refers to the critically evaluative strands of higher level performance. However, the common feature across both extracts is J's conceptualisation of Critical Thinking from a pedagogical perspective as an essentially metacognitive one.

Extract 3

```
1 J: So…for me...er…Critical Thinking in biology is em...as a
2 teacher… it's making the thinking process …process
3 explicit.
4 R: Right
5 J: So...em… pupils will implicitly have skills and different
6 ways of thinking but they quite often won't know when they're
7 doing which ones and therefore they don't know...in a given
8 context well, which one should I be doing? So they will describe
9 when they should be explaining or they will conclude when they
10 should be analysing so...for me it's making the style of thinking
11 explicit so…em … when we use sort of the Bloom's command words
12 then knowing if it's asking them to describe, what does a
13 description answer look like? What does an explanation look like?
14 What's an interpretation? What's an analysis so that they know
15 the style of answer and how they should lay it out…em...
16 therefore…so that it will be in parallel with the mark
17 scheme.
```

(Appendix M: J.25.2.13, pp. 268-269)

Firstly, an analysis of extract 3 reveals several features of J's understanding and use of Critical Thinking in his A level teaching which will be illustrated more fully throughout the rest of the chapter. Firstly, J clearly positions himself as a teacher of biology and his interpretation of Critical Thinking from a pedagogical perspective is framed within that context (l.2). J clarifies his interpretation of Critical Thinking as an essentially metacognitive one through which the thinking process is made explicit (ll.2-3). The imperative of the exam and its role as an uncontested driver in J's application of Critical Thinking is indicated through the repetition of 'should' (ll.8-10) in relation to what students are required to produce. The influence of the exam becomes more overt in lines 15 and line 16-17 with reference to 'style of answer' and 'mark scheme'. Indeed, J appears to have encompassed in his articulation of critical thinking outcomes not just the 'types of thinking' (lines 6-11) but also the written formats required by the exam as embodied by the mark scheme (lines 13-17). The integration of Bloom's taxonomy into this interpretation is also indicated in line 11 through the reference to 'Bloom's command words' suggesting here that these have been drawn on to support students' ability to discern between the different types of questions and

to help make explicit the difference in the answers they generate, as indicated through the repetition of 'looks like' in lines 13-14. I have termed these critical thinking outcomes as ct1 in terms of producing the types of written outcomes required by the exam, to distinguish them from different critical thinking outcomes indicated below in extract 4.

In the next extract, J's extended articulation of his personal conceptualisation of Critical Thinking as a pedagogic process goes beyond the immediate confines of the written formats of the exam and assumes a clear metacognitive character in relation to the *quality* of students' thinking especially in the context of the more open-ended evaluative questions which feature as part of the higher order type questions J referred to in extract 2 above (ll.7-21), and which I term ct2.

Extract 4

```
1 J: Also for me, it [Critical Thinking] ...it's the ...to (2.1)...at
2 the top end this…Critical Thinking is the...getting students
3 to really evaluate and challenge their own thinking to say, well,
4 when they've just given an answer getting them to think, well, is
5 that correct? Is...what is the significance of it? You know,
6 ...er…how does that link with that? Can you, you know, evaluate
7 your own thinking, have you actually come to the right conclusion
8 ...em you don't know, but if you actually think about it further
9 you can work out whether that is correct or whether you could take
10 a slightly different line.
```

(Appendix M: J.25.2.13, p.269)

An analysis of the extract reveals J's commitment to supporting students in developing a degree of autonomy in evaluating and improving their own thinking, as suggested through the repetition of ' getting students to' (ll. 2-3; l.4). As in extract 3 above, J manifests here his own clear understanding of what such evaluation should 'look like', as indicated through his rehearsal in this extract of the sorts of questions he would want students to be asking of themselves and their work. Even so, the fact that this is framed by the exam is still evident here through the reference to this thinking taking place with reference to an exam answer (l. 4).

The link between metacognition and Critical Thinking is explored more fully in the theory chapter, however, it is pertinent to be reminded here that Paul's conceptualisation of Critical Thinking is essentially a metacognitive one, which appears to be echoed by J in his articulation of Critical Thinking in extracts 3 and 4 above,

> '*Critical Thinking is the art of thinking about your thinking while thinking in order to make thinking better. It involves three interwoven phases: it analyses thinking; it evaluates thinking; it improves thinking'* (Paul & Elder, 2006, p.xvii).

From these two extracts, therefore, it is possible to trace J's blending of the three domains of A level outcomes, Bloom's Taxonomy, and the Critical Thinking model. J makes a distinction between two types of critical thinking outcomes required by the exam specifications: firstly, what I label as ct1 consists of students being able to discern between types of answers required by 'command words', influenced by Bloom (1956), such as 'describe', explain', interpret' and produce written answers in the genres required by such questions; and secondly, what I term ct2 outcomes consist of students engaging with the creatively and critically evaluative strands of higher level performance. However, J's conceptualisation of Critical Thinking in terms of a pedagogical approach is common to both in that it consists of equipping students with the metacognitive tools to be able to meet the demands of both types of critical thinking outcomes.

However, whereas, so far, J's commentary on Critical Thinking has been clearly linked to enabling students to meet the critical thinking outcomes of the A level exam, J also reveals in his interview a personal and professional commitment to working with students to inculcate in them the ability and disposition to reflect on their own thinking beyond the classroom. As such, he expresses his position in terms of biology teaching going beyond that of the content per se, but in relation to the skills he can foster in his students through the way he teaches, as illustrated by his own emphases,

Extract 5

J: …They're going to leave your subject ...you know I teach them this fixed box of knowledge but that's not going to help them really, probably most of it, you know you're going to go away and you won't use it, 'A' level biology, but the thinking you have is what's going to help you, so making the thinking explicit will give them some…such genuine skills for life. Whereas the content you teach them is really a method to teach them the thinking.

(Appendix M: J.25.2.13, p.270)

That developing students' metacognition is linked with the development of student autonomy is supported by the literature as explored in the chapter two. However, it might be argued that such an ideal as espoused by theorists, and by J himself above, loses something in translation into the reality of the classroom with all of the constraints at play in such a context. Indeed, in the context of these lessons it is still the teacher who controls the structure, timing and nature of activities, which are in turn driven by the imperatives of the A level exam. Furthermore, the analysis of lesson data in part three will show a very tight, even functional, relationship between J's use of Critical Thinking tools and approaches and the specific requirements of the A level exam. Nevertheless, as will also be shown below, J's

orchestration of tasks in the classroom is such that a certain metacognitive style of thinking is brought to bear on students' evaluation of their scientific understanding and reasoning when they apply their knowledge to a range of A level exam questions. Therefore, within these constraints, J appears to be supporting his students' development of a form of what I referred to as 'critical qualities' in chapter two, and, as such, he appears to be establishing a 'way of learning' that characterises what it is to be student of A level biology in his class.

To conclude this part of the chapter, I have examined the relationship between J's interpretation of critical thinking outcomes from the biology A level specifications and of Bloom's taxonomy. I have drawn on J's interview data to illustrate his own interpretation of the types of thinking required by the exam specification, and his pedagogic conceptualisation of Critical Thinking which is in essence a metacognitive one whereby he aims to make explicit to students the processes through which they are able to meet the critical thinking requirements of the A level biology exam. However, this approach appears to be framed within wider pedagogical values to develop metacognitive skills for beyond the A level biology classroom. It is the translation of this conceptualisation of Critical Thinking into pedagogical practices which will be the focus of part three of this chapter.

5.3 Critical Thinking and Pedagogical Practices

In this section I present illustrative examples from observation data to show how J draws on aspects of Bloom's taxonomy and specifically on the Intellectual Standards from Paul's model to enact pedagogically his metacognitive conceptualisation of Critical Thinking in the classroom. However, as in M's case study, J's primary concern is ensuring his students are able to meet the outcomes required by the A level specifications. It is this, above all, and the challenges such outcomes pose, that drives the pedagogic choices J makes. As such, the observation data appears to demonstrate a clear interrelationship between critical thinking outcomes, Critical Thinking processes drawing on Bloom's Taxonomy and Paul's Intellectual Standards, embedded within a collaborative classroom culture. These will now be examined further.

5.3.1 Students' Mastery of Complex Content to Support Critical Thinking Outcomes

As J alluded to in his interpretation of the biology A level requirements, the subject is 'quite content heavy' (extract 2, l.2). According to J, the content students are required to have mastery of for A2 biology is not only extensive, but also highly complex and technical. 'Knowledge and understanding' in this context, it can be argued, are not 'low level', in the way knowledge and comprehension have been classified traditionally in Bloom's taxonomy (Bloom, 1956) and have been challenged by some Critical Thinking theorists (see chapter two for further discussion). J indicates the complexity of content and the importance of students securing a deep understanding, in his commentary on lesson two, as indicated by the key words 'don't understand', repeated throughout the extract as highlighted below in bold italics in lines 4,5,8 and 10.

Extract 6

J: Yeah, so some bits of this unit [unit 5 of the A2 exam]
is particularly conceptually ... there are some bits that
are conceptually quite difficult so there are some bits they
don't understand, even if they've read it they just ***don't understand*** what it means or if you ask them to elaborate or
to pick it apart, they can't, and that's what...there's a
group of girls down the front who are doing respiration
and...***'I just don't understand*** this' so this first bit was
just to work on ...if there are any particular areas that
they ...they ***just don't understand.***

(Appendix R: J.29.4.13, p.302)

As Claussen and Osborne (2013, p.64) have identified, the school science curriculum can be perceived by students as full of details, lacking coherence, where students catch 'bits' but end up 'putting the wrong bits together'. Consequently, students are at risk of developing at best an impressionistic understanding of content rather than a secure mastery of it, which appears to be supported in this particular instance by J's comment above. In Critical Thinking terms, as explored in chapter two, what J is attempting to set up in this lesson is the process of enabling students to convert 'inert knowledge' into 'activated knowledge', (Paul & Elder, 2006, p.68), that is knowledge students can do something with, in this case, apply it to the A level exam questions.

In all lessons observed, the teacher appeared to place securing deep and authentic understanding of complex content as a priority. As will be explored below, his metacognitive conceptualisation of Critical Thinking, that is making the processes of securing this understanding explicit, underpin the structure and tasks set up in the lessons. This is illustrated below in the extracts from observation two. The structure of the lesson is clearly

framed by the need to ensure students had secure understanding of content; that they were able to call on it without notes; and that they could apply it to a series of exam questions. The questions students would subsequently work on could be categorised as ct1 (describe or explain) or ct2, being more open or synoptic (for example, 'suggest ways in which you might...)

Extract 7

1 T: So, you're going to work through your identified area,
2 you're going to work through these steps and this is what we
3 call ***hierarchical***... you're going to work through some
4 ***hierarchical*** thinking. There is no point in trying to apply
5 something if you do not understand it, if your foundation is
6 not effective. So ***the first bit*** we're going to do today is
7 comprehension. Ok, so I'm going to break this down a bit for
8 you, so we're going to spend some time on comprehension (.6)
9 […]***Then*** you're going to work to recall because in the exam
10 you don't have your notes on you, so can you (.7) recall
11 it? Then, you're going to apply it, so you should all have
12 individual past questions for the section you're going to
13 do.

(Appendix O: J.25.4.13, p.282)

A closer analysis of these instructions illustrates clearly the influence of Bloom on J as a structure for thinking. Firstly there is the 'progressionist' relationship, indicated by the repetition of the indexical 'hierarchical'; and secondly, through the language of the sequencing of cognitive processes whereby comprehension of factual knowledge, 'the first bit' (l.6) precedes its application. However, the context of the exam is such that comprehension, although necessary, is not sufficient, and students need to be able to draw on that knowledge unaided in the exam if they are going to be able to apply it, and therefore they need to be able to recall it, as indicated by the next stage in the sequence 'then' (l.9). Interestingly, J is adapting or interpreting Bloom's approach for his own purposes here, for whereas traditionally in Bloom's taxonomy 'recall' preceded 'comprehension (Bloom, 1956; Anderson et al, 2001) for J, as will be explored more fully below, 'recall' is not understood as 'regurgitation' of facts, but students' comprehension being so secure that they are able to 'distill' the information, itself another form of cognitive process which enables students to be able to 'manipulate' or internalise the information they have engaged with, making it 'theirs'. Indeed, in his commentary on the lesson, J suggests that although he presents 'understanding' and 'recall' as having a sequential relationship, he recognises that the processes may be less uni-directional than that, with recall serving to highlight misunderstanding and then to consolidate comprehension,

Extract 8

```
1 J: I mean some people are different but I think for a lot of
2 learners their recall is based on their comprehension, they
3 have to understand it to...to... for the process to form in
4 their mind.
```

(Appendix R: J.29.4.13, p.304)

It is after this stage of 'securing comprehension' that students 'test' their knowledge and understanding by moving to the application stage (extract 7, l.11) , which is seen in terms of applying their recently clarified or consolidated knowledge and understanding, which they can now draw on independently of textbooks and notes, to exam questions. Indeed, what these instructions appear to illustrate is the teacher making explicit to students not just the processes they are to engage with but also the 'cognitive rationale' for the way they will be working. However, J takes even further the making explicit of cognitive processes, by contextualising the very concepts of 'understanding' and 'recall' from Bloom's taxonomy. For example, in the same lesson, 'recall' is operationalised by J in terms of the A level exam as follows,

Extract 9

```
1 T: …A lot of you now should be getting to the point where
2 you're ready to now start testing your recall. This is a
3 ...is a skill in itself, ok, because when we go into the
4 exam, we have to have the ability to (.4) recall that
5 information accurately, ok? So, what I want you to do is, if
6 you're fairly happy with it, you can understand the concept,
7 now let's work on recall. So, either ((pointing to the
8 boards)) big boards, flash cards, I don't mind how you do
9 it, I want you to distil that section into what the key
10 things you have to bring into the exam in your mind. Ok,
11 check it has the depth, have you put enough of the
12 detail in, in terms of biology we're talking about all of
13 the specific terms, have you explained it at an A2 level?
14 Also, does it have the breadth? That means have you covered
15 all of the necessary points that you'll need in order to
16 get the marks if they ask you a long answer question?
```

(Appendix O: J.25.4.13, p. 288)

There are two points to be made here: firstly, 'recall' as understood by J in this context, and, as referred to above, plays out in the reality of the classroom as a complex process consisting, in this case, of: distilling key information (l.9); appropriate level of detail (l.11); the use of specific biological terminology (l. 12-13); and covering a range of points needed for a long answer (ll.14-15). As such, the data here appears to support the critique of Bloom by Critical Thinking theorists as explored in chapter two, and to be examined more fully in the discussion chapter (ch.7), that knowledge acquisition is itself an intellectual achievement resulting itself from critical engagement with content. Secondly, J appears to have embedded into this explanation references to the Critical Thinking model, drawing on

'breadth' (l. 14) and 'depth' (l. 11) from the Intellectual Standards operationalised by J in terms of 'enough detail' and 'specific terms'. The role of this feature of the Critical Thinking model in J's teaching in supporting students' mastery of complex content required by the A level will be examined in more detail below.

To summarise, the key point emerging from this section of the analysis is J's assessment of the challenges the A level presents in terms of mastering a vast body of complex biological processes and how he translates into his practice his interpretation of Critical Thinking as 'making the thinking process explicit' for his students in order to address this challenge. He does this by drawing on Bloom's taxonomy as a framing structure for his lesson and for how students approach their preparation for the A level exams. As such, all three aspects: critical thinking outcomes; Critical Thinking processes; and Bloom's taxonomy all appear to be part of the pedagogic dynamic illustrated in this episode. It is in this context that J's use of the Critical Thinking tools of 'Intellectual Standards' will be examined: firstly in terms of his explicit foregrounding of particular Standards as metacognitive tools with which students are able to critique their own understanding and written answers; and secondly, as infused into J's own questioning and interaction with students to secure their understanding of complex content.

5.3.2 The Intellectual Standards

The Intellectual Standards (see ch.2 p.26) represent J's most explicit use of Paul's model and, as will be shown, J's interpretation of these is driven by what he identifies as the requirements of the A level biology exam. In his interview, J identified the Intellectual Standards as a specific Critical Thinking tool and claimed that he had started to draw on these to inform his questioning in lessons:

Extract 10

```
1 J: I have…have started to go back and look back through the Critical
2 Thinking… like the Standards...the Intellectual Standards …em…and to get
3 more of a routine of adding those Standards and those questions into
4 lessons to challenge the students[…]In my head I've got a list of them
5 [Intellectual Standards] so when I (go) to a pupil and they ask me
6 something I will go through sort of a routine of questions like
7 significance and clarity and depth ...em …so that em...I know that that
8 can push their thinking further.
```

(Appendix M: J.25.2.13, p.269)

An analysis of the extract reveals a strong sense of teacher agency, as indicated by the repetition of the first person singular: 'I have started' (l.1); 'I've got a list of them' (l.4); and 'I will go through sort of a routine' (l.6). The repetition of 'routine' and 'a list in my head' would also suggest the development

of a practice over time in relation to the Critical Thinking Standards with the aim of developing student thinking (ll.7-8). In addition, his interview suggested he was developing more than just a set of question prompts for himself, but also a tool to be made explicit to students for them to develop the ability to self-assess the quality of their own answers. Whilst the Standards exist in generic terms as part of the Critical Thinking framework, J, as was seen in M's case study, engages in a process of operationalising the terms so that, in the context of his classroom, they assume a highly indexicalised form (Johnstone, 2008) in relation to their application to A level biology exam answers.

At the start of lesson one the Standards 'clarity, relevance, depth and logic' were written on the whiteboard and on permanent display throughout the lesson, and were also part of the teacher's lesson slides, as illustrated below (see figs. 5.1 & 5.2).

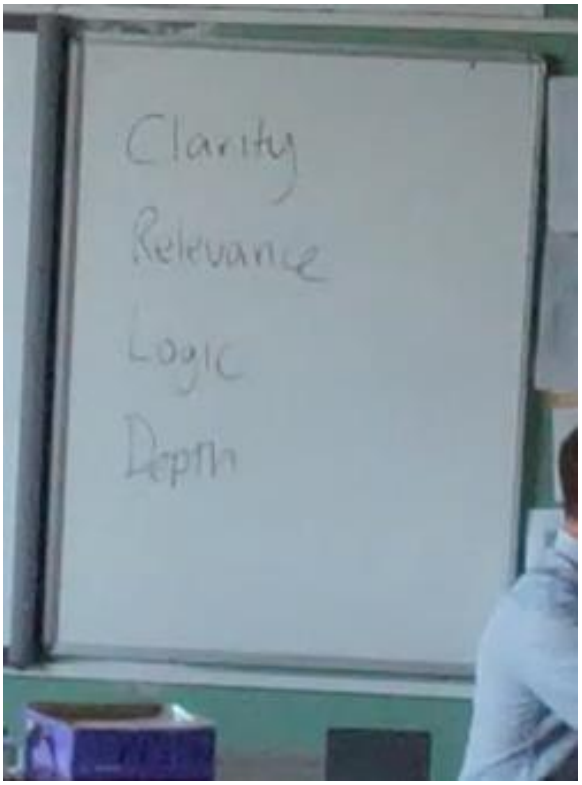


Fig. 5.1 Standards on display throughout the lesson

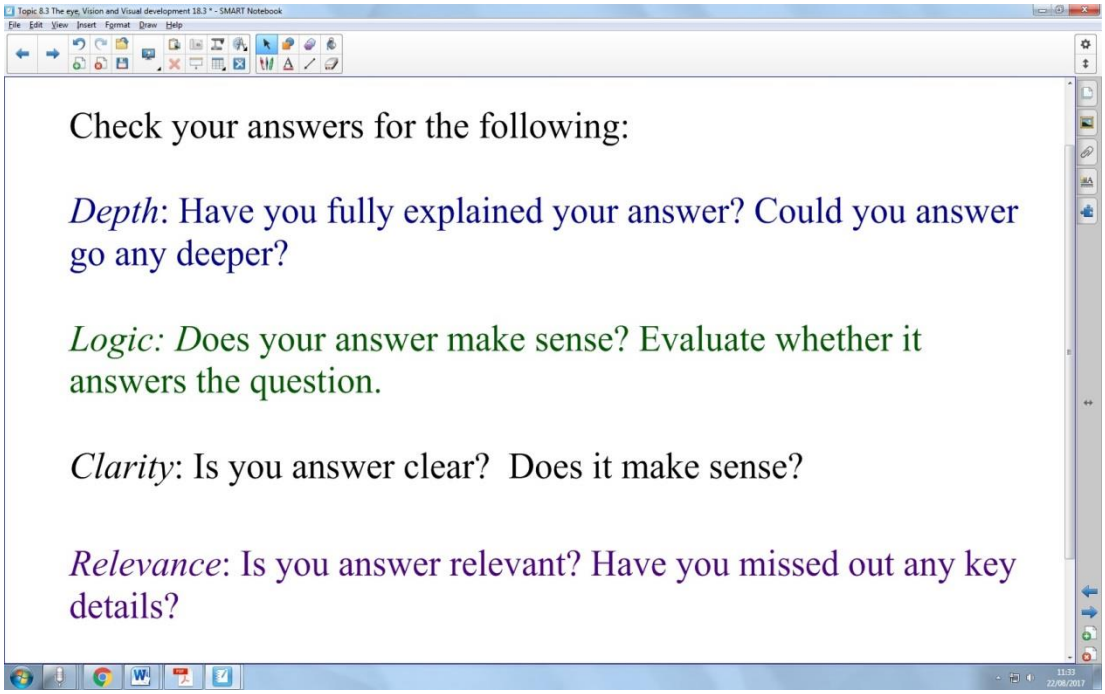


Fig 5.2 Intellectual Standards lesson resource

The question prompts used in the lesson resource appear to be the teacher's own interpretation of the Standards from Paul's model (Paul & Elder, 2006) as presented in chapter two. However, 'depth', 'clarity', ' relevance' and 'logic' in the lesson assume an indexical form as indicated by specific references to the type of A level answer the teacher is expecting students to develop. In this context, depth is understood as 'full' answers; relevance including a reference to 'key details'; and logic as an 'indicator' to ensure the answer directly addresses the question. In this way the Standards assume an indexical form not just for the subject content, but more precisely for the requirements of a specific part of the exam specification and mark scheme. These indexical forms are elaborated upon further in the teacher's instructions from observation one, relating to his question prompts, as indicated below.

Extract 11

T: Right, I'm going to put these questions up in a second and I want you to discuss them from your notes with your partner. What I want you to check in each other's answers in discussion are the depth, logic, clarity and relevance so we've been working on these over the last couple of weeks so the depth, which means is it detailed enough? Does it go detailed enough? Are you going far enough down? The logic, does it make sense? Does it link to the answer? Is it in a clear sequence? Clarity, is it clear ...is it...are there confusing sections? And the relevance, is what your ans...what you're discussing actually answering the question? Ok, so those reminders are up on the board. So talk to the person next to you.

(Appendix N: J.7.3.13, p.277)

For example the repetition of ‘detailed enough’ (ll.5-6) and ‘far enough down’ (l.6) serves to reinforce what is understood by ‘depth’. ‘Logic’ is also contextualised in relation to the exam answer as shown in lines 7 and 8 in the form of three questions. J’s commentary on this part of the lesson serves to illustrate what is emerging as a clear link between his interpretation of the Critical Thinking Standards and the requirements of the A level exam.

Extract 12

```
1 J: We use logic a lot because so many biological systems are a
2 sequence of events em… and so they have to...they don't actually
3 get marked on the logic but if they have the logical order, it
4 means they much more likely to get all of the marks, like the
5 longer answer questions.
```

(Appendix Q: J.13.3.13, p.300)

Logic here is specifically understood in terms of a logical sequence of biological processes, as explored in the first part of this analysis above (extract 2:ll.4-6). J’s comments, therefore, appear to illustrate how an aspect of the Critical Thinking model, in this case the standard of ‘logic’ is being ‘brought to’ A Level biology as a metacognitive tool to support the development of the types of answer likely to secure higher marks. This blending process between the Critical Thinking model, metacognition and the A level is reinforced further in J’s commentary on his second observation (extract 13 below) where he elaborates on how he tries to use the Standards to enable students to identify what they need to do to improve their answers

Extract 13

```
1 J: So, it's really only been this year that I've been trying
2 to use those Critical Thinking words when you're trying to
3 describe to a pupil what's missing in their answers as quite
4 often they will lack the…depth, with A2 they need that
5 much...em…the detail and it's quite nice so I've been trying
6 to use that consistently so that they can get that (.8) they
7 realise what...so you're consistently saying ...so when you
8 say 'depth' they know what you mean.  Em... equally the
9 breadth, because the long answer is making sure you've got
10 the start and the end one and you've got the whole
11 sequence, so I think ...em...it does fit in very nicely
12 there ... em... so pupils become aware of how their
13 answer...how you can change your answers depending what the
14 requirements are.
```

(Appendix R: J.29.4.13, p.303)

References to ‘what’s missing in their answers’ (l.3); ‘they need that much detail’; ‘the long answer is making sure you’ve got … the whole sequence’ (ll. 9-11) indicates that the A level exam is the key driver in this teacher’s classroom. In turn, that J’s use of Critical Thinking is driven by the exam is further illustrated by his acknowledgement that he is contextualising Critical Thinking terms such as ‘depth’ and ‘breadth’ so that they assume a shared meaning in relation to the demands of the exam, ‘so when you say “depth”, they [students] know what

you mean' (ll.7-8). As a result, the Critical Thinking Standards, when made explicit and used consistently, according to J, enable students 'to be aware of how to change your answers depending what the requirements are.' (ll.13-14). This was well illustrated by several exchanges across all three lessons, one of which is examined below, where a student was able to articulate where she had lost marks on her answer.

Extract 14

```
1 T: What are you working on today?
2 S3: Synapses(.4) because that seems to me that they can give
3 you like 4 or 5 marks but in a context (.) so like they'll
4 give you acetylcholine and they'll ask you how it is
5 transmitted to give you an action potential ...and I did
6 that question and I got like 2 out of 5 because I couldn't
7 remember this middle bit ((pointing to the textbook page)).
8 So, I looked at the mark scheme, and they really want you to
9 say pre-synapses=
10 T= Yeah, yeah it's very, very specific, I agree
11 S3: So if you say it just binds the receptor, they only
12 give you a mark because you're not saying which membrane
13 is=
14 T=Yeah yeah, yeah for sure, for sure.
```

(Appendix P: J.9.5.13, p.295)

The student's choice to work on the topic of synapses is determined by her assessment of the quality of her answer from the mock exam paper. Lines 2-5 indicate an extended reflection on the requirements of the question as set by the exam board, referred to as 'they'. The student develops this in lines 6-9 by identifying the 'deficit' in her answer and where she lost marks. The student demonstrates a strategic use of the mark scheme to identify how to repair her answer by using the specific detail required (l.9 and ll.11-13) which corresponds to J's contextualisation of 'depth' in terms of being detailed enough (see extract 10 above).

To conclude this section on the Intellectual Standards, these constitute J's most explicit use of Paul's Critical Thinking model, driven by the demands of the A level exam. Indeed, J acknowledged in his interview that he is engaged in a process of selection from the model, as best suits what he sees as the needs of his students in relation to the A level exam.

Extract 15

```
1 J:I think I use lots of them [aspects of the model] independently what
2 I'm not really applying is the whole model cohesively↑ So, I think if you
3 asked my students ...'Do we do Critical Thinking? Some may say yeah, some
4 may not. They know that ...if you ask them about the different types
5 of...you know is it explicit about the different types of thinking I
6 think they'd know that but we...if you ask them what are Intellectual
7 Standards, they wouldn't know.
8 R: Would they need to?
9 J: Well, that's what I think, probably not, I think...I think it's up to
10 me as the...practitioner to pick that[the Critical Thinking model] apart
11 and take the bits that are relevant to them.
```

(Appendix M: J.25.2.13, pp.269-270)

Critical Thinking, therefore, does not appear to be foregrounded in J's teaching as a discrete body of skills or knowledge known as 'Critical Thinking' to be 'done' or taught in its own right, as indicated in lines 1-3. As a result, Critical Thinking is not necessarily a term or concept J shares with his students but it does manifest itself as part of J's pedagogic repertoire informed by his commitment to teaching in such a way to make the thinking and written formats required by the A level explicit to his students. The implications of this in terms of Eraut's concepts of the professional transformation of 'public knowledge' into 'personal knowledge' and then 'action knowledge' will be explored more fully in the discussion chapter (ch.7).

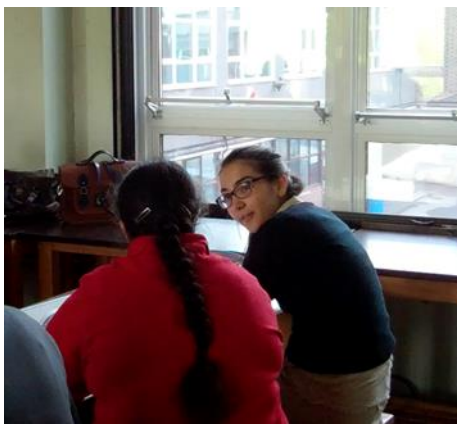
To conclude, in this section I have illustrated how J has selectively drawn on a specific feature of Paul's Critical Thinking model, notably the Intellectual Standards, as part of a process of operationalising the requirements of the A level specification, especially, as indicated in the examples above, in terms of demonstrating understanding of complex scientific content. In this sense, the Standards themselves are contextualised not in terms of the discipline of biology per se, but more specifically for the outcomes required by biology as presented in the A level biology specifications and mark scheme.

However, as with M, J's use of his selected features of the Critical Thinking model seem to be embedded within a classroom culture where collaborative exchanges between teacher and student and student to student appear to be established practice. As will be illustrated below, such exchanges appear to be the locale where specific scientific misunderstandings are surfaced and addressed. From a Critical Thinking perspective, there are two points to be examined: firstly, it will be shown how, in these interactions, J 's questioning supports the development of precision, depth, and breadth as explored above; secondly, it will also be seen how the pedagogical practices J has established appear to foster in students the opportunity to engage in a critical questioning not of what is 'uncontested' scientific content but rather a critical questioning of the quality of their own understanding, serving to support J's aim to foster in his students the ability and disposition to evaluate their thinking for themselves in keeping with his metacognitive view of Critical Thinking (see extract 4 above).

5.3.3 Collaborative Practices

As shown in terms of the structure of all three lessons (see appendix F), each lesson allowed students to work together in pairs or small groups on securing understanding of a topic,

whether these were topics identified by the teacher, as in lesson one, or students identifying their own topics, in lessons two and three. As a result, instead of a single teacher-led lesson taking place, there were 12 or 13 simultaneous mini lessons taking place of pairs or small groups working collaboratively across the class. Across all three lessons I captured audio recordings of 18 extended interactions the teacher had with specific students, pairs or groups. The collaborative nature of the classroom is illustrated below from images taken from lessons (See figs 5.3-5.7).



Figs 5.3-5.7 collaborative practices in J's classroom

As such, J appears to have introduced into the structure of these lessons the space and opportunity for students to engage with quite dense propositional content in paired discussions. In other words, as with M's lessons (see ch.4), J is adhering to an approach to learning whereby knowledge and understanding is facilitated through collaborative dialogue between peers (Mercer, 2000). The implications of this data for the apparent alignment between socio-constructivism and features of Critical Thinking pedagogy as explored in the theory chapter (see Thayer-Bacon,2000; Miri et al, 2007; Sale, 2007; Li Li, 2011) will be examined further in the discussion chapter (ch.7).

As was pointed out in chapter two (Dillon, 1994; Osborne, 2010), even though the subject matter is uncontested propositional content, it can still be a fruitful focus for peer discussion, as will be illustrated below. Indeed, as Dillon (1994, p.33) explained, the criterion for a purposeful topic for discussion is 'if it is *something in question for students'* (author's original emphases). As a result, as examined in chapter two, discussion and questioning of what would be described in Paul's Critical Thinking framework as 'inert information' (Paul & Elder, 2006) are means by which students can process, 'activate' and appropriate that information for themselves. Questioning, therefore, plays a key role in the discursive nature of a lesson and is seen as evidence of students' deep engagement with the content (Dillon, 1994). Indeed the way lessons were orchestrated by J was based on questions students had raised, if implicitly, about a particular topic they had not understood well. For example, in lessons two and three, students had identified specifically something they were not sure about resulting from their review of their own answers from a practice A level exam paper. In other words, this was content with which they needed to grapple, make sense of, and 'resolve' (Dillon, 1994). Therefore, although students were dealing with apparently uncontested propositional content, the lesson had been orchestrated in such a way to foster students' critical engagement with that content. Indeed, there appear to be two forms of questioning at play in these lessons: the formal exam questions, whether from the paper they had completed previously or the exam questions they had brought with them for the 'application' stage of the lesson; and students' own questions which formed part of the discussion phases of the lesson. The relationship between these two forms of questioning is a subtle one: it could be said the exam questions were a catalyst for students' 'critical questioning', requiring them to think in terms of 'what do I need to know?', 'Why is what I

know not sufficient to answer this exam question?'. In other words, as will be explored below, as a consequence of the task orchestrated by the teacher, questions arise from students that are their own authentic questions engendered by their attempts to respond to formal externally imposed exam questions.

An analysis of interactions across all three lessons appear to reveal with a high degree of consistency three distinct features: firstly, teacher questioning as a means of scaffolding students' construction of understanding and addressing misunderstandings or gaps in understanding, including their understanding and use of 'key terms'; and secondly, teacher interactions guiding students through the sequential or causal relationship between events which constitute the essential nature of biological processes, as J had highlighted (see extract 2, ll.4-6 above). As also examined in M's data (see ch. 4), these two features tend to be characterised by the IRF/I sequence (Bloome et al, 2008) which serve to create a chain of questioning through which the teacher scaffolds student understanding of a complex biological process, illustrating one of the socio-constructivist strategies to support students' Critical Thinking. Furthermore, a third feature of these interactions is that of student questioning or student initiated exchanges. This is presented through a role reversal of the IRF structure, as will be shown below.

However, what appears to result from this very deliberative approach to checking the sequence of biochemical processes, whether by the teacher or student, is to 'slow down' the thinking, so that the student is able to identify and address precise gaps in understanding. In this way, the student is supported in creating a coherent understanding from what may be perceived as a range of disparate details (Claussen & Osborne, 2013) or in Critical Thinking terms, converting inert knowledge into 'activated knowledge' (Paul and Elder, 2006).

These features are illustrated in the two lesson extracts below (extracts 16 & 18). In extract 16, two students are working on the topic of nerve impulses and the biochemical process of an action potential (See Edexcel Pearson, 2009, pp.204-205). Key words (Fairclough, 1993) arising from an analysis of the exchanges highlight the importance attached to the sequence of events within a biochemical process as suggested through the repetition of the verb 'to happen' combined with ascertaining the sequential structure through terms such as 'so', 'then', 'because', highlighted in bold italics in the transcription. As such, the teacher appears to be reinforcing students' induction into the core scientific principle of causation. In addition, teacher questioning requires precision in the use of technical terminology as such precision

and detail, as explored more fully above, is required for high marks in the description and explanation A level exam questions. It can be seen in this extract how the teacher surfaces any insecure grasp of detail and addresses this through his interactions with students.

Extract 16

1 S9: Sir, I'm not sure about the action potential...the
2 stages like= (I)
3 T: =On this?((pointing to diagram students have started to
4 draw on their whiteboard))(R)
5 S9: Yeah(F)
6 T: Ok, so why don't you run me through it and
7 I'll correct you(I)
8 S9: So resting potential is at minus 70, ***so*** that's when the
9 potassium ions leave and inside's negative and outside's
10 positive and it's balanced, there's no net movement
11 of...any ions or potassium ions, it's balanced, sodium ions
12 can't move and when the threshold level's reached ...above
13 threshold there…the electrical impulse goes=(R)
14 T:= Ok, stopping there. So, when you say threshold, what is
15 threshold? What's ***happening?(F/I)***
16 S10: An electrical impulse...it's a neurotransmitter(R)
17 T: Ok (0.9) how do we, if we got to here ((pointing at
18 diagram)) so, as you said, we're at minus 70, so, on...in
19 the membrane, what have we mainly got on the inside? (F/I)
20 S9: Negative…no K+ (R)
21 T: yeah, and on the outside?(F/I)
22 S9: Emm, is it NA? (1.2)(R)
23 T: ***Ok,*** so minus....positive...alright ((teacher draws on
24 diagram)) So, you were talking here, what's ***happening***?(F/I)
25 S10: Increase in electrical activity (R)
26 T: Yeah, and ***so*** what's ***happening*** in terms of the
27 membrane?(F/I)
28 S9: It's ***becoming*** more positive now(R)
29 T: It's becoming more positive, yeah, why?(F/I)

(Appendix O: J.25.4.13, p. 290)

Within this extract there are a series of moves (Eggins and Slade, 1997) through which insecure understanding on the part of the student is surfaced and then addressed. In his opening move (l.1), the student himself articulates his own lack of understanding, directed at the teacher. The teacher's reacting move in line 6 is to position the student to initiate his explanation. The student's explanation of 'resting potential' in lines 8-13 appears disjointed and may be indicative of insecure understanding. This appears to have been identified by the teacher who interrupts the student in line 14 to slow the thinking down, 'Ok, stopping there,' and to check student understanding of the key concept of 'threshold'. The student's answer in line 16 lacks coherence in terms of the question 'what's happening'. As a result, in lines 17-19 teacher questioning takes the student further back to retrace the sequence to lead to a clearer answer to 'what's happening?' The student's answer in line 22 takes the form of a question suggesting again uncertain understanding which has now been surfaced.

The teacher's confirmation that this is correct means he can now return to the original question having enabled the student to clarify details (l.24) and so the student can now move further in the sequence (ll.25-28)

In his commentary, J articulates the features of the process adopted here and which are played out across his interactions,

Extract 17

```
1 J: Em... so then what I usually try to do and this is quite
2 common when someone doesn't understand...particularly stuff
3 like this so you sit down and you talk it through with them,
4 you get them to make the steps and tell you what's happening
5 next, and then you draw it in and ask some leading
6 questions, and once they've done that, they have to
7 translate that into a series of written (0.7) logical bullet
8 points that they will then have to use in the exam because
9 they won't ever really get asked to draw it.
```

(Appendix R: J.29.4.13, p.303)

Questioning was a key feature explored as part of the Critical Thinking workshops (see appendix A), although this tended to be in relation to the use of the Intellectual Standards or the Elements from Paul's model (see ch.2) to frame questions to probe for conceptual understanding. What appears to be happening here is the teacher not necessarily using explicitly in this context the language of the Intellectual Standards or Elements, as in Paul's Critical Thinking framework, but, he is listening *for* clarity and precision of explanations as relevant to the context of A level biology which inform his subsequent 'leading' questions. As a result of this process, he appears to be surfacing conceptual misunderstanding and then, through questioning, building student understanding.

Extract 18 below also serves to illustrate the importance of securing a clear understanding of the causal nature of a biochemical process. However, the role of student questioning which appears to draw on the teacher as a resource is further heightened in this example. In this extract, as will be shown below, the IRF structure is disrupted by the student interrupting the teacher in order to present his own question or comment. Where the IRF structure is in operation, it is the student who is frequently leading these exchanges. In this extract, the student is working through the topic of sliding filament theory, which relates to the processes involved when a nerve impulse leads to the contraction of a muscle fibre (See Edexcel Pearson, 2009, p.145).

Extract 18

(Indexicals for causal links are highlighted in bold italics and will feature in the analysis below).

```
1 T: Which bit are you looking at today?
2 S11: Sliding filament theory, well, you know, the bit when
3 the heads bind to the active site (1.2)
4 T: Yeah so when the heads bind to the=
5 S11: = Actin filament
```

6 T: Yeah
7 S11: Yeah
8 T: So the myosin binding site=
9 S11: = Does the ATP break down (0.6) into= (I)
10 T: =No, it binds ***and*** it moves ***and*** the ATP binds to release
11 it ***and then*** it's hydrolysed to (.) ratchet it back.(R)
12 S11: Hydrolysed means? (I)
13 T: To break down(R)
14 S11: To break down ...the ATP?(I)
15 T: Yeah(R)
16 S11: ***Ahh, because*** you need it to move back = (F)
17 T=Yeah it's the=
18 S11=do you need it to move forward?(I)
19 T: ***because*** it's...em... because it's like cocking a gun ***so***
20 the ATP is hydrolysed and moves the heads backwards ***so that***
21 in a primed position they bind, ratchet forward using the
22 energy from the hydrolysis of ATP= (R)
23 S11= and that's when it hydrolyses...when it's going back
24 T: When it's going back, yeah.
25 S11:***I see***...but here((refers to textbook)) it says ATP is
26 released when it forms a (cross bridge) (1.13)(I)
27 T:((reads out from textbook)) 'Myosin heads bind with
28 myosin binding site (inaudible)' (1.6) Yeah((cough))
29 because it's hydrolysed but it's still attached to the head
30 ***then*** when it binds to the binding site the ADP and PI are
31 released, head moves forward, new ATP attaches, is
32 hydrolysed, moves backwards but the ADP and Pi are not
33 released until it moves backwards.
34 S11: Ahh, I see.

(Appendix O: J.25.4.13, pp.283-284)

In line 5 the student interrupts the teacher's input which is repeated in line 9, where the student interrupts to ask his own question to secure his understanding. The teacher responds with an explanation which clarifies the sequence of events involved in the process (ll.10-11). This move is replicated in lines 12 and 13 where the student questions the teacher's use of the key term 'hydrolysed' which the student then builds on in line 14 to check his understanding of hydrolysed in the context of this specific process. That this represents a move forward in the students understanding is indicated in line 16 where he makes his own causal link as indicated by 'because'. Once again, in line 17, the teacher's attempt to develop his explanation is interrupted by the student who, in line 18, asks a question about a further implication of what he has just clarified. This leads to the teacher explaining the sequence of events in lines 19-22. Again, the student who wants to confirm his understanding interrupts this in line 23. However, this leads to a further question from the student in line 25 which suggests a conflict between this explanation and what he has read in the textbook. The teacher reformulates the explanation in the textbook, clarifying the sequences involved in the process. The last line indicates that the student's confusion may have been resolved.

In this extract the student appears to be not just actively involved in constructing his understanding but actually taking the lead role in the process, through his questioning of the teacher and his questioning of the apparent dissonance between the teacher's explanation and the textbook. Indeed, it could be argued that through this questioning, the student is illustrating what Mc Peck (1990) and Paul (1985) refer to as the 'achievement' of 'knowing' (see ch.2) and in doing so, the students is in effect displaying an aspect of the 'critical qualities' referred to in the theory chapter whereby information is not passively received but about which the student is actively curious.

As part of the analysis of this exchange, it is also interesting to include the written record which resulted from it. As J explained in his commentary above, he usually ends his individual interactions with a student or small group by asking them to capture their new understanding in written bullet points. The outcome from this exchange was recorded on a large whiteboard, which several of the students were using in the comprehension and recall stages of this lesson, and this is presented below in figure 5.8.

The notes appear to illustrate the student's acquisition of the format and style required by the exam with a clear, detailed chain of events as illustrated through the numerical sequence of the different stages in the process with indexicals of 'causation' suggesting that causal links have been appropriated by the student. However, what is disguised in this outcome is the process of critical engagement the student had demonstrated through his exchange with his teacher, as indicated above. The two 'products' of this classroom event, the dialogic exchange led by the student and the subsequent construction of written notes, serve to reinforce the relationship presented in this thesis between Critical Thinking as part of a pedagogical process informing how teachers teach which enables students to acquire the outcomes as laid down by an A level specification. In the context of A level biology, the content as presented in fig 5.8 below is not critically challenged content, in terms of it being able to be contested. However, the student, as part of the way in which he appropriated understanding of that content, was able to engage in a critical process whereby he questioned his own understanding, which translated into questions for the teacher.

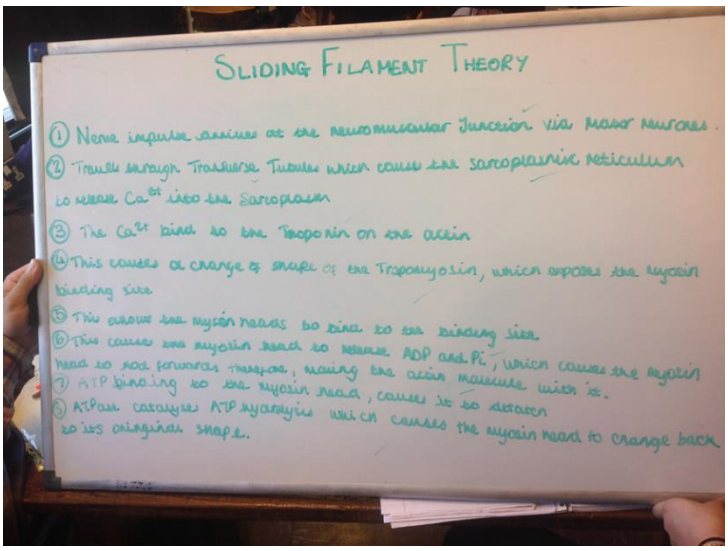


Fig 5.8 Student's class notes on sliding filament theory

There are several examples across all three lessons where students explicitly identify what they do not fully understand and openly seek the teacher's help. For example,

Extract 19
```
1 S5: Sir, can you go over the pupil reflex and how it involves
2 photoreceptors because I have an exam question but I don't really
3 know what they're talking about.
```
(Appendix P: J.9.5.13, p.295)

Extract 20
```
1 S4: I need your help, sir.  You know here, yeah ((points to notes))
2 does it ...how do you explain it when it goes to the next bit like
3 when it spreads (1.8)
```
(Appendix O: J.25.4.13, p.287)

Such evidence appears to support J's claim made in his commentary that his students have developed a way of working or being in his classroom whereby they are able to identify for themselves what they do and do not understand.

Extract 21
```
1 J: I think they usual...I don't know...from my experience of the
2 class they're usually quite (.) reflective in terms of when they
3 do...and when they don't understand it. And they've got to the
4 point when they say 'I can tell you what it is but I don't really
5 understand why' or 'I understand it all but I just can't...' and
6 they can usually themselves gauge where they're at.
```
(Appendix R: J.29.4.13, p.302)

Indeed, this claim, which could be said to be substantiated through the data presented above, does appear to correspond with J's pedagogical values and the role of autonomy within the context of Critical Thinking referred to in the theory chapter, albeit within the constraints of preparing for the A level exam.

5.4 Conclusion to the chapter

In this chapter I have investigated the relationship between Critical Thinking and J's interpretation of the A level specifications for biology as translated into the pedagogical practices he employs in his A level classroom. Firstly, I have examined through lesson data, interview data, commentary data and documentary evidence, J's interpretation of the critical thinking outcomes inherent within the A level biology specifications and their link with Bloom's taxonomy: namely, the importance of securing mastery of complex content; the ability to apply such understanding to a range of question formats; and the ability to engage with critical evaluation of scientific information and processes to be able to secure the marks for the higher grades. Observation data has shown how J converts his essentially metacognitive conceptualisation of Critical Thinking into specific pedagogic practices which are tightly linked to the A level outcomes. To this end he draws on a specific feature of Paul's Critical Thinking model in the form of the Intellectual Standards blended with his interpretation of Bloom's taxonomy to make explicit at several levels to his students the processes through which critical thinking requirements of the A level specifications can be met. However, this is also housed within a classroom culture which supports collaboration and a degree of student responsibility for monitoring the quality of their own understanding. In other words, although content may be determined by A level specifications, and what students have to learn to do may be prescribed, this does not remove the sense of teacher agency in shaping ***how*** students learn and engage with what is stipulated in the specifications. Although this may not meet the ideal of student autonomy espoused by J, the data would support a claim that it does include to a certain degree the ability and the disposition to assess or evaluate one's own learning; to question; and to engage in authentic discussion over the content at hand. All of which could be said to be dimensions of what it is to think 'critically'.

Chapter 6 Case Study Three

In this final case study I investigate the relationship between Critical Thinking and teacher L's interpretation of the A level specifications for philosophy and ethics (OCR, 2010) as translated into the pedagogical practices she employs in her Year 12 AS level classroom. The key findings from this data appear to reinforce those from previous analyses (see chs. 4&5) in that the curriculum requirements as laid out in the A level specifications for each subject seem to inform the teacher's conceptualisation of Critical Thinking and determine the selection and use of aspects of Paul's Critical Thinking model. In other words, as with M and J, Critical Thinking is drawn on pragmatically by the teacher to serve the overriding demands of the A level curriculum, rather than being a pedagogical aim in itself. Indeed, as will be explored below, L's position towards Paul's model as 'Critical Thinking' is more ambivalent than that presented by M and J, which has implications for how it is rendered by her in her teaching.

As with the previous chapters, the case study is divided in three parts. I begin with a short overview of the types of data included in this analysis and the context of the lessons which constitute the main body of the data. In part two I explore the apparent distinctive relationship between the fields of philosophy, argument and Critical Thinking as both process and outcome, as it is this relationship that appears to be the source of the difficulty experienced by L's A level philosophy and ethics students which, in turn, appears to influence L's choices in terms of Critical Thinking pedagogical approaches. Indeed, it should be noted that the singular interrelationship that appears to exist in philosophy in terms of Critical Thinking as process and critical thinking as outcome means the CT/ct distinction used hitherto in this thesis is more nebulous in the context of this particular discipline. Part three, which is the substantive part of the chapter, examines the following aspects arising from the empirical data: firstly, the issue of the challenges the A level content presents L's students; secondly, three specific pedagogical approaches adapted from Critical Thinking training programme which consist of 'close reading', 'reciprocal teaching', the use of the Intellectual Standards, and how these are adapted by the teacher to address the requirements of the A level course. Thirdly, there appears to be a clear metacognitive dimension to the way L orchestrates some her Critical Thinking pedagogical practices, and this is also explored in the analysis. However, as this is the final of the three case studies, I

will finish the chapter with a short summary of all three data chapters before proceeding to the discussion chapter.

6.1 Data

The main content to be analysed for this chapter is drawn from the conversations held during the observations of three 45- minute Year 12 AS level philosophy and ethics lessons taught by teacher L between early March and late April, 2013 , with the AS exam due to take place in May. Further details of the lesson materials and teaching sequences can be found in appendix F. The three lessons covered the following topics:

Observation one (L.4.3.13): final lesson on ontological arguments for the existence of God.

Observation two (L.27.3.13): introduction to Kant's moral argument for the existence of God.

Observation three (L.19.4.13): St Augustine's theodicy, the concepts of 'privation' and 'free will'.

This observation data is supplemented with other sources of data as outlined in the methodology chapter (ch.3). The data for this case study therefore consists of:

- Transcribed talk from the audio recordings of three lessons.
- A video recording of the lessons providing data to analyse, where appropriate, of the physical context of the classroom, student organisation and groupings, teacher positioning, and the use of resources.
- Lesson resources comprising two A level textbooks: OCR Philosophy of Religion for AS and A2 (Taylor, 2009) and OCR AS Philosophy and Ethics (Taylor, Eyre and Knight, 2008); photocopied extracts on ontological arguments (Jones, Hayward & Cardinal, 2005) and Kant's Moral Argument (Taylor, Eyre and Knight, 2008); student worksheets; and the teacher's PowerPoint resources.
- Transcribed talk from two of L's own commentary on her lessons, the recordings of which she watched with me three to four working days after the original lesson (L. 8.3.13; L.24.4.13).
- Transcribed talk from L's interview prior to lesson observations (L.25.2.13).
- A Level specifications in use at the time of the research (OCR 2010).
- Resources from the Critical Thinking Fopundation: Instructor's Manual Critical Thinking: Tools for Taking Charge of your Learning and Your Life (Paul & Elder,

2002); The Thinker's Guide to How to Read a Paragraph (Paul & Elder, 2008b); The Thinker's Guide to Intellectual Standards (Paul & Elder, 2008a)

6.2 Philosophy, Argument and Critical Thinking

In this section I examine the potentially distinctive and complex relationship the subject of philosophy has with argument and Critical Thinking as this appears to have a direct bearing on L's conceptualisation of Critical Thinking and her view of Paul's model. Furthermore, it seems that the complex relationship between philosophy, argument and the critical thinking outcomes stipulated in the philosophy and ethics A level underlies the difficulties L's students experience with it.

The A level specifications for philosophy and ethics, as shown below, appear to follow the standard division for Assessment Objectives (AO) at A level in terms of knowledge and understanding of defined content (AO1); and higher order skills (see chapter two for a more detailed discussion of Bloom's Taxonomy and critical thinking outcomes).

Extract 1
AO1 Demonstrate Knowledge and Understanding
Select and demonstrate clearly relevant knowledge and understanding through the use of evidence, examples and correct language and terminology appropriate to the course of study

AO2 Analysis, Evaluation and Application
Critically evaluate and justify a point of view through the use of evidence and reasoned argument

(OCR, 2010, p.69).

It is interesting to note that L's own conceptualisation of Critical Thinking in philosophy appears to link to this dual aspect of the course, as indicated by L in her interview,

Extract 2

```
1 L:I think that there are...there's two things you're trying to teach them: one
2 is the content and the concepts; and one is the technique of writing fluently
3 in…it's a kind of academic literacy thing… And they[students]need...to be able
4 to organise their thinking into a coherent line of argument as well as just
5 understanding the topic.
```
(Appendix S: L.25.2.13, p.311)

However, on closer examination of the specifications, it seems that the 'relevant knowledge and understanding' referred to in AO1 is itself of a highly conceptual nature, as opposed to the more basic 'factual' content seen as the 'starting points' as presented by the specifications examined in history/politics, and biology (see chs.4 &5). Examples of the specified content from the AS philosophy and ethics specifications are set out in table 6.1 below.

Plato: the Analogy of the Cave *The Republic VII. 514A–521B*	Candidates should be able to demonstrate knowledge and understanding of what might be represented in the Analogy of the Cave by the following: the prisoners, the shadows, the cave itself, the outside world, the sun, the journey out of the cave and the return to the prisoners.
Plato: the concept of the Forms; the Form of the Good	Candidates should understand what Plato meant by 'Forms' and be able to demonstrate knowledge and understanding of: the relation between concepts and phenomena; the concept of 'Ideals'; the relation between the Form of the Good and the other Forms.

Table 6.1 Examples of AS philosophy and ethics specified content (OCR 2010, pp.12-13)

Whilst the rubric in the specifications for philosophy and ethics is the same as that used in other A level specifications, ' candidates should be able to demonstrate knowledge and understanding of…..' , the content which students are expected to demonstrate an understanding of is highly abstract, conceptual content. In other words, whilst the cognitive process dimension of 'knowledge and understanding' maybe of a low order in a Bloomsian sense, although this is challenged by some Critical Thinking theorists, as explored in the theory chapter (see ch.2) and J's case study (see ch.5), it could be argued that the conceptual knowledge dimension for the A Level philosophy indicated above appears to be of a much of a much higher order than factual empirical information of the kind required in other A levels. For example, 'what might be represented in the Analogy of the Cave' contains within it a range of complex concepts: 'representation' itself is an abstract term relating to 'signify' or 'symbolise' rather than 'is'; this is complicated further by a range of possible interpretations suggested by the modal '*might* be represented'; and analogy itself is a complex concept based on the comparison of relationships between two things. Similarly, 'the relation between concepts and phenomena' requires knowledge and understanding of the links between two abstractions – the concept of a concept, and the concept of phenomena. Such content, I would argue, contrasts sharply with the more concrete empirical facts required for A level politics or even the more complex empirical content in A level biology, as examined in the two previous data chapters (see chs. 4& 5).

The challenge presented by such highly conceptualised content will be evident from students' responses as they encounter the material outlined in the overview of the lessons above. So when L, in her interview describes her course as 'Critical Thinking',

'*I mean…yeah… to think critically you have to ...they do it all…all the time. I mean…that's just the AS course and the A level course…'* she could be said to be echoing the point made

by Lipman (1988) on the relationship between philosophy and Critical Thinking. Lipman claims that philosophy as a discipline deals with the contestable, the indeterminate and the problematic and it is this that makes it distinctive in generating critical thought. In essence, he claims philosophy is nothing less than the heritage of human thought providing 'ideas for people to chew on- ideas that don't get used up because they are persistently contestable.' (Lipman, 1988, p.106). Indeed, this position appears to be supported by the content of the philosophy of religion units illustrated by the extract of the specifications, above, and the nature of the interactions such content generates in the classroom, as explored in the empirical data in part three of this chapter.

Moreover, in contrast to the specifications examined for biology and politics, where the term 'critical' was used but only in only certain parts of the specification, an analysis of the A level specifications for philosophy and ethics reveals that references to 'criticality' permeate the whole document. Phrases referring to the requirement that candidates 'discuss critically' the topics that make up both the AS and A2 programmes run like a refrain throughout the whole of the specifications, examples of which are highlighted in the table 6.2 below:

AS Topics	Critical thinking reference from the specifications
Plato: the Analogy of the Cave *The Republic VII. 514A–521B*	Candidates should be able to ***discuss critically*** the validity of the points being made in this analogy.
Plato: the concept of the Forms; the Form of the Good	Candidates should be able to ***discuss critically*** the validity of the above points.
The concept of God as Creator	Candidates should be able to discuss these areas ***in a critical manner.***
The Ontological argument from Anselm and Descartes; challenges from Gaunilo and Kant	Candidates should be able to ***discuss critically*** these views and their strengths and weaknesses.

Table 6.2 Examples of 'criticality' in the AS and A level specifications (OCR, 2010, pp.12-13)

The criteria for 'criticality' is stipulated in the context of these specifications as being 'through the use of evidence and reasoned argument' (OCR, 2010, p. 69). Indeed the reference to 'argument' here signals a further dimension to the relationship between philosophy and Critical Thinking.

As was explored in chapter two, there appears to be a link between the two fields of Critical Thinking and argument with Govier (1989) amongst others (Hoaglund, 1993; Warburton, 1995) suggesting that argument may constitute an aspect of Critical Thinking, but is not necessarily synonymous with it (Andrews, 2009; 2015). Moore (2011b), in his study on Critical Thinking across the curriculum at university (see ch.2), identifies 'argument' as

central to philosophy, constituting both the object of study to be summarised or evaluated, and also the process of inquiry, through the production of arguments. In other words, as referred to above, in terms of the critical thinking outcomes/Critical Thinking processes construct used in this study, Critical Thinking in philosophy appears to be both outcome and process. Indeed as will be shown in the lesson data below, A level philosophy students are expected to learn, understand and evaluate very specific forms of argument, namely inductive and deductive forms, which come directly from the field of logical theory (Toulmin, 2003), as well as present their understanding through written argument.

To summarise, in this section I have examined an apparent relationship between philosophy, argument and critical thinking outcomes in the A level specifications and in the wider field, where Critical Thinking appears to be more heavily integrated into the very content of the subject of philosophy compared to the other A level subjects featured in this study. This is manifested in terms of the contested and conceptually complex ideas that make up its content as well as the focus on argument both as an object of study and the rhetorical mode required by the exam.

The difficulty that this presents students emerges from the data analysed in part three. Indeed, it is the teacher's precise assessment of the difficulty her students experience that appears to have a direct influence on her selection and implementation of specific Critical Thinking tools.

6.3 Critical Thinking and Pedagogical Practices

In this part of the chapter I draw primarily on observation data to illustrate the nature of the challenge the critical thinking outcomes required by the AS exam present L's students and how she has translated specific features of Paul's Critical Thinking framework to inform the pedagogical practices she deploys in order to enable her students to meet such requirements. As a result, this part of the chapter addresses specific issues relating to student difficulty; specific pedagogic approaches adopted by L in the face of these difficulties, which appear to combine a metacognitive and collaborative approach to learning; and her use of the Intellectual Standards.

6.3.1 Student Difficulty

The difficulty students experience in securing a deep and authentic understanding of the complex content of the course is evident from lesson observation data. The extracts analysed below are illustrative examples of students' encounters with complex content, which appears to be from a completely new epistemic paradigm to them.

An analysis of L's talk from her interview and her commentary on her lessons revealed frequently occurring terms related to students' 'difficulty' in understanding, which I have highlighted through my use of bold italics, for example,

Extract 3

1 L: One of the things ***that's the hardest*** thing is, is the concept of a type of
2 argument. ***That's a real tricky one*** so…so an a posteriori argument as opposed to
3 an a priori argument…And so with the ontological argument, I've just been
4 teaching it… and ***they didn't get it*** ((laughing)) so...they...em wha...they have
5 to get ...em…what ...what analytic means and that it comes from the definition
6 so that links to the type of argument.

(Appendix S: L.25.2.13, p.306)

Extract 4

1. L:((Referring to photocopied sheet they're working from)) This is the
2 bit ***they get confused with,*** inductive and deductive, that's why we did
3 quite a lot on that because ***they're still not sure***.

(Appendix W: L.8.3.13, p.339)

One feature of the difficulty with the content L identified for her students is the leap from GCSE to A level, which she argues is significant in her subject. A possible explanation for the challenge such content presents maybe in the fact that A level content is so different to anything students had experienced before up to GCSE, indicated by the repetitions and emphases used in the interview extracts below,

Extract 5

1 R: Em…in comparison to what you do at GCSE what's distinctive about the A
2 level programme?
3 L: Er(.) okay it's ***really really different*** er…because what we teach at GCSE is
4 (.) effectively comparative religion and what we're teaching at A level is
5 really philosophy of religion and ethics...and (.) **just** from a Christian point
6 of view=
7 R: =Right
8 L: So it's ***completely…completely different.***

(Appendix S: L.25.2.13, p.305)

According to L, the A level represents a significant epistemic shift from understanding beliefs and practices of different faith communities at GCSE, to exploring religious issues from a highly conceptual perspective within the framework of formal philosophical argument , as illustrated by the extracts from the A level specifications above. That this is a challenge is supported further by the frequently recurring indexical of 'groundwork' and 'foundation' which

featured in L's interview and in her commentary on lesson three, where the class was working on the biblical story of Genesis as preparation for Augustine's theodicy,

Extract 6
1 L: The course we're doing now has lots of kind of ***ground work*** stuff so they do
2 Plato and Aristotle and then Christian views of God because...with our kids you
3 can't necessarily assume that they've got that...So that's why we chose it
4 because we think it's better at… for ***grounding*** [...] At AS they start off with
5 (.) em…ancient Greek philosophers so they look at Plato and Aristotle, and
6 then…they do Judeo-Christian views of God which is all the sort of ***ground work***
7 stuff. (Appendix S: 25.2.13, p.305)

Extract 7
1 L: ((commenting on the first part of lesson 3 and the story of Genesis))
2 We had to do quite a lot of that ...that ***groundwork*** because obviously
3 they don't know the story that well so we spent a lot of time on that
4(.8) because you can't really critique it if you don't know the story.
(Appendix X: L.24.4.13, p.341)

Lesson data provides a range of evidence illustrating the challenge students face in securing an authentic understanding of conceptually complex philosophical content, which, in these lessons, was framed within the structures of formal deductive or inductive argument (lessons one or two) or within the context of analogical reasoning (lesson three). An illustrative example of insecure understanding is demonstrated in the extract below. In this example, students reveal an insecure understanding of Anselm's ontological argument and Kant's critique of it. There is evidence of students attempting to use the structure of argument, indicated by the presence of argument indicators and the language of reasoning, highlighted in bold, but the substance of the argument appears to be insecure.

Extract 8
1 T: I, did you find out anything from R?
2 S8: R found that Gaun…Gaulino?
3 T: Gaunilo
4 S8: Gaunilo …Gaunilo's argument was very strong ***because***…em it kind
5 of ***refuted*** what Anselm was saying
6 T: Why did…for what reason?
7 S8: Eer (.8) she didn't really say anything about that but she said
8 it points out the ***major flaws*** in the argument …she just said that
9 it points out the ***major flaws*** in Anselm's argument
10 T: Who said this?
11 S9: I did
12 T: So what are the major flaws, then?
13 S9: Well, I meant to say Kant ***because*** like he says that like not
14 everything… like not everyone can imagine as well, so that, like,
15 goes against what Anselm was saying
16 T: Why?
17 S9: Because he goes, like, just because you can imagine God,
18 everyone …like everyone has a….like God exists
19 T: Right, he doesn't say that though, does he? He doesn't say,
20 if…if that was the argument, ok, it's not just you, R, lots of
21 people are doing this, that's not what Anselm says, you've got to
22 give Anselm a fair crack of the whip, ok? He's not saying, just
23 because everyone can imagine God, God exists. What are the gaps
24 missing? Remember we had the gaps missing before, didn't we? What
25 are the gaps in that, R?
26 S9: Like ***everyone*** has ***the same*** concept of God like ***all the***
27 ***descriptions*** and [that

28 T: What, no, no] no, be careful, be careful, he doesn't say
29 everybody has the same concept of God
30 S5: A concept of [God
31 T: Right] He says everyone has a concept of God in their heads, so
32 you've got the theists with a concept of God in their head, and
33 then you've got the atheist.
(Appendix T: L.4.3.13, pp.313-314)

Although there are attempts to use the language of reasoning such as providing a justification through the use of 'because' (l.4) and reference to reasoning lexicals such as 'major flaws' and 'refute' (ll. 5,8 &9), the actual reasoning in lines 4 and 5 is weak as the student's conclusion that Gaunilo's critique is strong does not follow from the reason that it refutes Anselm's argument. S9's attempt to explain Kant's critique in lines 13-15 lacks precision and then is shown to be mistaken in lines 17-18. The teacher articulates the mistaken view and acknowledges that this is a widespread error amongst the class. Further imprecise understanding is displayed in S9's answer in line 26, which is characterised by the 'general' with his reference to 'everyone', 'the same' and 'all descriptions', lacking any sense of the nuance of the original argument. This is then addressed by the teacher with the support of another student, in lines 29-31.

The imprecision illustrated in this extract was also referred to by L in her commentary on the lesson. Her reflection below appears to indicate the prevalence of such misunderstanding.

Extract 9
1 L: That's really common, they do that all the time. So, what R has
2 just said is more or less what they always do in their essays which
3 is why I picked up on it (.7) because I'm not...often if they don't
4 quite understand it, that's what they'll do, they'll just say (.5)
5 they've got a clear ...they've got the idea that it's something to
6 do with (.) the idea and therefore got a gist but they can't see
7 the like (.) the stages that lead to it.
(Appendix W: L.8.3.13, p.338)

The reference in this commentary in lines 4 and 6 to ' they don't quite understand' 'it's something to do with', 'got a gist', 'can't see the stages' are all indicative of the issue of students having an 'impressionistic' grasp of content but lacking a secure understanding of it. As such, this resonates with what is described from Paul's account of Critical Thinking as 'inert information', as explored further in chapter two and also illustrated in chapter five. It is precisely this issue of 'impressionistic' understanding that L aims to address through adopting some of the teaching strategies developed through the Critical Thinking workshops and attending the San Francisco conference. In other words, L is drawing on certain Critical Thinking approaches to supplement her A level teaching to address the difficulties her

students encounter with the complex content of the A level course, as suggested by her positioning of Paul's Critical Thinking model in pedagogical terms in her interview,

Extract 10
1 L: Em..I think (.6) I think when we went to San Francisco that was really
2 good in terms of getting…em...a broader view ...and...em (.) you know
3 certain workshops that were really… kind of contextualised it [Critical
4 Thinking] for teaching and I think that was really good.
(Appendix S: L.25.2.13, p.310)

How L has, in turn, contextualised some of these ideas for her own teaching will now be examined.

6.3.2 Critical Thinking Pedagogic Approaches: Close Reading; Reciprocal Teaching; and the Intellectual Standards

Having illustrated through the data presented above the difficulty students have with the A level philosophy content I will firstly examine two specific Critical Thinking teaching strategies selected by L in an attempt to address these issues: close reading and reciprocal teaching.

All three AS lessons observed included use of close reading and/or reciprocal teaching strategies or adaptations of them, from Paul's Critical Thinking approach. For clarity of explanation and analysis, I will examine these in turn in terms of:

i) The orchestration of the task as presented in the lesson and the metacognitive features made explicit by the teacher.

ii) The interactions they generated in relation to securing understanding of complex content.

iii) The link between the Critical Thinking processes and critical thinking outcomes required by the A level specifications.

I will then finally analyse the teacher's use of the Intellectual Standards where the blending of Critical Thinking model and critical thinking requirements of the exam appears to be clearly illustrated.

6.3.2.1 Close Reading

(i) Orchestration of tasks

Based on the principle that 'the work of close reading consists in mindfully extracting and internalizing important meanings implicit in a text', as Paul outlines in his account of Critical Thinking (Paul & Elder, 2008b, p.9), one of the strategies practised as part of the teachers' workshops was that of students having to articulate their own understanding of each sentence in a paragraph,

> *'A **first reading** begins with your translation of an author's wording into your own alternative wording. In other words, you put the words and thoughts of an author into your own words. Your paraphrase is only successful if your words capture the essential meaning of the original**. A first reading** is successful if the reformulation of the text it represents opens up, or at least **begins** to open up, the meaning of the*

original' (emphases in original) (Paul & Elder, 2008b, p.19).

It is interesting to juxtapose Paul's explanation of close reading with the language of L's instructions for a close reading task in lesson three. Students are asked to explicate the meaning of Augustine's analogy on Free Will[6],

Extract 11

```
1 T: We 're going to look at Augustine's explanation now. So, if you look
2 on the sheet, there's a quote there from Augustine explaining for himself
3 this idea of what he thinks about Free Will, ok? So what I want you to do
4 first of all, I want you to look through it, look at any words in the
5 quote you don't understand, underline them and look them up, and then I
6 want you to put Augustine's quote into your own words. Ok, so you cannot
7 use the same words, it's got to be, it's got to be like you're doing a
8 translation, ok, really, really closely wording it and looking at it
9 really carefully and putting it into your own words underneath.
```

(Appendix V: L.19.4.13, p.335)

Her instructions clearly focus on the function of 'translation', echoing the language used by Paul above, as indicated in line 8 and 'putting it into your own words' lines 6 and 9. L also appears to operationalise the task further by making explicit to students the procedures that would be helpful in order to accomplish the translation, as referred to in lines 4 and 5. L therefore goes 'beyond' an outline of the task, and frames it in an explicit way for students so that they are clear on how to approach the task. This 'recontextualisation' of the basic Critical Thinking close reading approach is further illustrated from data in lesson one.

In this lesson, in order to secure student understanding of the logic of Anselm's ontological argument (see appendix F), students were asked to self –assess the level of their own understanding as red, amber or green (see figure 6.1 below from the teacher's white board resources). An analysis of her explanation which accompanied the slides seems to indicate an operationalisation of the terms used so far in this analysis of 'impressionistic understanding' and 'secure ' or 'authentic understanding' as manifested by an ability to put the meaning 'in your own words'. Key phrases in the transcription to be elaborated upon will be highlighted through bold italics.

[6] 'The generosity of God is such that he has not stopped himself creating a creature which he foreknew would not merely sin but determine to remain sinful. Just as a runaway horse is better than a stone which cannot runaway because it lacks free-will and self-direction and perception; so the creature which sins by free-will is better than one which does not sin because it has no free will.' St. Augustine, see Taylor (2007) for further discussion.

Fig 6.1 'Assessing understanding' lesson resource

Extract 12

1 T: I want us to think how we are with ...We've kind of finished
2 this topic, we've done this topic but I want to see (.) where you
3 feel you are at the moment, ok? So, just...em...decide where you
4 think you are ((T points to traffic light statements on IWB)) you
5 only have to write down the number and I'm going to come round to
6 have a look. So, if you think, ***I'm really properly confused, I***
7 ***can't make head nor tail of it at the moment, I'm still really***
8 ***stuck,*** that's then red. Amber, ***you kind of know*** what...when we're
9 talking about it in class, ***you can kind of keep up with it,*** keep up
10 to speed with it but if I said to you now "you explain it" you'd
11 be like, "Oh, I'm not sure". Ok, so ***it's kind of like you can***
12 ***follow it but you couldn't explain it.*** And then if you think,
13 "Yep, ***I'm really confident, I would be happy teaching this to***
14 ***someone else,*** that'd be green". So quickly write down
15 where...where you feel you are at the moment. One sentence, where
16 you feel you are, and then why.

(Appendix T: L.4.3.13, p.316)

Lines 6 to 8 operationalise for students what is meant by a lack of understanding; lines 8-9 and 12-13 indicate some level of receptive understanding suggested by the repetition of 'kind of' but is also manifested by an inability to articulate meaning clearly in own words. Lines 13-14 would represent what someone who really securely understood the material would be able to do.

Most students captured on the teacher's voice recording in the lesson identified themselves as amber or 'yellowish green' indicating students' own awareness of the impartial nature of their understanding, as suggested by an example of exchanges below,

Extract 13

1 T: Where do you think you are?
2 S8: Yellowish green
3 T: Bits of it...which bits are yellow, which bits are green?
4 S8: Like all of it's generally green but it's just like I missed
5 out bits of it
6 T: So some of the stages of the argument?
7 S8: Yeah
8 T: so that's good, that you identified that, go on
9 S13: I'm...er...yellow
10 T: go on

11 S13: I'm amber at explaining it, but other bits I'm green, like
12 all of this ((pointing to notes pages)) I know, but that bit…I'm
13 not sure if I could (.5) like really explain it.
(Appendix T: L.4.3.13, p.316)

It is appropriate to signal here that L had orchestrated the close reading task as an explicitly metacognitive one whereby the object of each student's assessment is the quality of his/her own understanding against very clear, operationalised criteria. In this way, L is contextualising for her own pedagogic ends Paul's essentially metacognitive definition of Critical Thinking, as examined more fully in chapter two,

> *' Critical Thinking is that mode of thinking – about any subject, content or problem- in which the thinker improves the quality of his or her thinking by skilfully analysing, assessing and reconstructing it. Critical thinking is self-directed, self-disciplined, self-monitored and self - corrective thinking. ' (Paul & Elder, 2006, p.xxiii)*

The purpose of the reading task, therefore, is framed by students' own awareness of the nature of their understanding of particular content (the ontological argument). Within this frame, the close reading task takes on a further metacognitive dimension by 'slowing down' the reading process, literally. In this way, students are expected to interrogate the meaning of each line, externalise an inner conversation they might have about its meaning by sharing and shaping their understanding with their partner, and then consolidating that understanding by making a written record of 'their' understanding of the line. Illustrative examples of interactions generated by the close reading tasks are now examined to ascertain to what extent, if at all, the task 'opens up or at least begins to open up meaning' for the students involved.

(ii) Classroom interactions

An analysis of the IRF (Bloome et al, 2008) structures displayed within the interactions generated by these Critical Thinking based tasks across all three lessons reveal a degree of consistency in the teacher's use of questioning as a means of surfacing and assessing carefully students' detailed understanding of the key concepts under study, and of then scaffolding their understanding, as also seen in J's case study (ch.5). In most cases, where the teacher is addressing misunderstanding, she leads the IRF structure. As in M and J's case studies (see chapters 4&5), the scaffolding 'function' of the interaction appears to be indicated by the teacher's feedback (F) combined with an immediate follow up initiation (I) which takes further forward the chain in reasoning so that the common structure appears to

be IRF/I. Indeed, what appears to be happening as revealed by an analysis of the moves the teacher and students are engaged in through these interactions (Eggins & Slade, 1997), and as also found in J's case study (ch. 5), is the teacher surfacing conceptual misunderstanding, listening for clarity of explanations, depth of understanding, and then, through questioning, building student understanding to address misconceptions or shallow understanding, as relevant to the subject content of the A level.

The first example is taken from lesson three as students give feedback on their close reading of Augustine's quote, as referred to above.

Extract 14

```
1 T: What about the next bit, M? ((T reads from quotation)) 'As a
2 runaway horse is better than a stone which cannot run away because
3 it lacks self-direction and perception' (I)
4 S3: A runaway horse is better than a stone which doesn't have the
5 choice (R)
6 T: It doesn't have the choice, and also the?(.8)(F/I)
7 S3:  Emm, I don't know (R)
8 T: Perception? What's perception? (F/I)
9 S3: Understanding? (R)
10 T: Yeah, perception is like how you understand the world and how
11 you take in the world, so self- direction is the choice to do your
12 own thing em but also to be able to take in like we're all
13 perceiving each other now, aren't we? We're aware of where we are
14 in the world. So the horse has got awareness and the ability to
15 choose. ((T reads last sentence)) So the creature who sins by free
16 will is better than one that does not sin because it has no free
17 will[…] Right, T?  (F/I)
18 S12: I said that (.8) em the creature that is either obedient or
19 disobedient is better than one which is neither.(R)
20 T: (.7) It's more than that because what's the key phrase that he
21 uses? (F/I)
22 Several students: FREE WILL(R)
23 T: Free will, so did anyone come up with anything else for free
24 will? (F/I)
25 S4: Is it to be able to [choose to do evil
26 S1: To make your own] decision (R)
27 T: To make your own decision, so it's better to have something
28 that can make its own decisions but make bad decisions than have
29 something that can't make any decisions (.8) that's what he's
30 saying↓ So even knowing, that if you create us like we are when we
31 can choose for ourselves you're going to make the wrong choice,
32 that's still better than making it so that you have no choice. And
33 that's what you have to think, whether Augustine is right about
34 that (F/I)
```

(Appendix V: L.19.4.13, pp.336-337)

The teacher opens the interaction by reading out the line to be translated. S3 responds (l.4) offering a partial reformulation, understanding 'self-direction' in the original text as 'choice'. The teacher accepts the answer but indicates it is only a partial understanding and probes for the meaning of the second part of the sentence, which serves to surface the student's lack of understanding (l.7). Another student offers a rendition of 'perception' as 'understanding' which is extended by the teacher (ll.10-15). The process is repeated in subsequent lines where S12's translation in lines 18-19 indicates a partial understanding of

the line from Augustine. The teacher's feedback in lines 20 and 21 indicates that this is not a full rendition of Augustine's meaning and here the teacher elaborates on S12's contribution by directing her students towards a key concept (free will) to establish a full understanding of the sentence. S4's response elaborates on the concept of 'free will', which is extended by S1. This is then responded to by the teacher who reformulates and extends further the student's definition. The episode ends with the teacher setting up students to take an evaluative stance on what Augustine has said. In other words, the episode illustrates moving through the Critical Thinking process of close reading towards a critical thinking outcome as required by the A level.

The interaction below, taken from an extended teacher-student exchange in lesson one on deductive and inductive arguments, illustrates further the opportunities generated through the close reading task to surface and address misunderstanding. In this stage of the exchange, the teacher's questioning serves to probe and surface imprecise understanding of the role of a premise in a deductively valid argument. However, there appears to be a shift taking place in lines 10-17 with a reversal of roles in the IRF structure, indicating a development in the student's understanding.

Extract 15

1 S11: If it's deductive then it's=
2 T:= yeah but what ...what's the premises 28 mean? (***I***)
3 S11: What you're trying to say ***(R)***
4 T: What do you mean by what you're trying to say? (***F/I***)
5 S11: What it's trying to state, like, sentences ***(R)***
6 T: Yeah, sentences, so it's a stage in the argument so a premise
7 ...premise is a sta... so if that premise is true then it leads to that
8 premise then it leads to that premise you're going to get(.) the
9 conclusion.***(F)***
10 S: So this sentence has to be true (.2***)(I)***
11 T: No↑ but...the argument, yeah, in other words if we accept the
12 premises, as in a bachelor means an unmarried man, then if you say that
13 D is a bachelor, it means he must be = (***R)***
14 S11: You don't really need a conclusion***?(F/I)***
15 T: No, you don't, so that...that's the whole point, because it's
16 contained within the word. ***(R)***
17 S11: So you don't need a conclusion↓(***F)***

(Appendix T: L.4.3.13, p.318)

The student's imprecise explanation of 'premise' in lines 3 and 5 could be said to be indicative of impressionistic understanding. The teacher's feedback in lines 6-9 elaborates on the relationship between premises and conclusion in a deductively valid argument. At this point (l.10) the student resumes the role of initiation with a question to check her understanding of what the teacher has said, and this is continued in line 14 The student question in line 14 suggests she is starting to see the connection between premises and a logically necessary conclusion arising from the premises.

The student's intonation in line 17 suggests a statement of confirmation rather than a question, indicating a possible shift in her understanding.

An analysis of these examples of interactions generated by the close reading tasks appear to offer an insight into the processes through which students were attempting to construct an understanding of the meanings in the text. In other words, this approach could be said to provide the means by which students are immersed in the cognitive process of what the teacher terms 'deciphering' and 'working out' the content (see extract 16 below) and at least attempt to transform the information from, in this case, the 'voice' of the textbook into the students' own voices and subsequently the voice required for A Level writing. It would appear that students, by having to articulate that understanding, are engaged in the process of developing an understanding of the complex ideas of the course, and therefore moving towards 'making it their own' (Bakhtin, quoted in Mitchell, 2001, p.14). Indeed, the link between socio-constructivist theories of pedagogy and certain conceptualisations of Critical Thinking were indicated in the theory chapter (ch.2) and these will be elaborated upon further in the discussion chapter (ch.7). A practical pedagogical point to be highlighted, however, was that the class were given almost twenty five minutes for the task, to make sense of a paragraph of seven sentences. The dilemma this presents teachers in terms of 'coverage' of content at the expense of securing depth of understanding was referred to by L in her commentary whereby (since her engagement with the Critical Thinking training programme) she reports making an explicit choice to spend time on strategies such as close reading to ensure students' secure understanding,

Extract 16

```
1 T: …In the past I might have skipped over that but then now, probably
2 how my teaching has changed now, I take a tiny, tiny bit and take ages on
3 it is probably better than a lot of ...than spending longer on something and
4 also getting them to decipher it, the fact that they've had to work it out
5 and hopefully that means they will remember it better than a simple text or
6 when they look at a simpler text, which they will, it should make it easier.
```

(Appendix X: L.24.4.13, p.343)

6.3.2.2 Reciprocal Teaching[7]

(i) Orchestration of tasks

The term 'reciprocal teaching' was used at the Critical Thinking conference to describe the process where students have to read carefully and make written notes on a selected text or part of a text, in order to explain to a partner or others what they have understood, using their notes only, not the original text. As part of this approach, students also need to focus on the clarity of their oral communication,

> ' *In a well-designed class, students often engage in oral communication. They articulate what they are learning: explaining, giving examples, posing problems, interpreting information, tracing assumptions etc. They need to learn when they are being vague, when they need an example, when their explanations are inadequate, etc…….One of the best ways to learn is to try to teach someone else. When we have trouble explaining, it is often because we are not as clear as we need to be about what we are explaining.' (Paul & Elder, 2002, p.15)*

Again, L draws on this approach to support student engagement with the conceptual complexity of the material they are studying, as indicated in her interview,

Extract 17

1 L: I think I use em...the teaching techniques from it [Paul's
2 framework]so…em….so in A level teaching the things like the reciprocal
3 teaching….I use to a point em...and then I …em...it's a tricky thing to do to
4 get a balance with I think because em...because the texts are so...so complex
5 sometimes they...the danger with the team teaching thing is they'll ...em…
6 teach each other wrong...wrongly. So...em… so I do use it because I think (.)
7 sometimes, like I've just used it in the last lesson, if ...if I want them to
8 engage with the texts sometimes I'll get them to do that first and then I'll
9 do my teaching because sometimes I think if I just teach them and they
10 haven't even tried to access it then they can just start to switch off. But
11 whereas, if you've tried it and you know that you don't understand what a
12 predicate is and then I explain it then they kind of ...then they can go back
13 over it…I use that one quite a lot.

(Appendix S: 25.2.13,p.308)

L demonstrates a clear sense of agency in her interpretation of the value of the approach and how she can best implement it in her own context with her particular students. This is indicated by the frequent use of the first person in this extract: 'I think'; ' I use to a point'; 'I want them; 'I'll get them to…'; and ' I'll do my teaching'. She is aware of the practical difficulties of the approach and consciously decides to use it as a 'way in' for her students as a way of 'priming' them to be more receptive to an explanation which will then follow the reciprocal teaching activity. As such, L tailors the approach to her own pedagogical context as is seen in the example below. L explains this process herself in the lesson,

[7] The concept of reciprocal teaching originates from Palinscar & Brown (1984) whose work examines the role of reciprocal teaching in promoting comprehension-fostering and comprehension-monitoring activities amongst poor readers. Reciprocal teaching as presented at the Critical Thinking San Francisco conference appears to be building on this concept.

Extract 18

```
1 T: So we're going to do reciprocal teaching, we're going to teach each
2 other, ok, just to remind us ((teacher refers to slides on the board)). So
3 by the end of the lesson we will have done both bits of this [Kant's
4 moral argument] and you'll be able to add to that. So you've now got the
5 background but you need to be able to be specific about what the moral
6 argument is […]So if you have a look, the bit we're going to do is this
7 'why are we moral' section at the end.(.6) and one person is going to do
8 the three postulates of morality, so you're going to need to do freedom,
9 immortality and God. And then the second person is going to do the
10 argument. So it's only a little, little bit I want you to teach today.
```

(Appendix U: L.27.3.13, p.324)

However, as with her rendition of the close reading approach, L introduces an explicit metacognitve layer to the task by orchestrating a short and focused class discussion on effective teaching and learning behaviours in a reciprocal teaching context. The full transcript can be found in appendix U (L.27.3.13, pp. 324 & 325) but a summary of the advice elicited from the discussion included:

- Be clear so others can understand you.
- Know what you're doing…by reading the full paragraph.
- Explain in good detail.
- Test your partner.
- Listen.
- Share your view.
- Be really careful that you read it really carefully.
- Give the names of the thinker, context and an accurate quote.
- Take notes.
- Ask questions.

Illustrative examples of the interactions generated by the task will serve to show to what extent, if at all, students are engaged in a process of clarifying their understanding of the lesson material.

ii) Classroom Interactions

As will be shown below, interactions generated through this task appear to reflect those in close reading and indicate students being engaged in a process of questioning the texts themselves as revealed through a change of role from teacher-led IRF to student-led IRF structures. In the extract below, the student is engaging critically with the content in that she does not 'accept' unquestioningly the argument as presented in the text on Kant's moral argument (see appendix F).

Extract 19

```
1 T: N, did you want some help?
2 S13: Yeah, I don't really understand (.6) it
3 T: Right, ok, so what's the actual argument
4 S13: No, I understand this bit but not this bit ((points to the 3
5 postulates))
6 T: Ok, but that's the actual argument that you need
```

7 S13: Yeah but I don't understand this anyway
8 T: Alright, let's go through them then. Tell me what you do understand
9 S13: Well, that's just saying actions are moral because we have the free
10 will to carry it out and there's nothing forcing us to do it
11 T: Right, otherwise it's not moral
12 S13: I don't get how you get from that to ...I don't understand why is
13 it linked to immortality…
(Appendix U: L.27.2.13, p.328)

S3's declaration in line 2 indicates she is monitoring her own understanding and that this is done to some degree of sophistication given that she is able to clarify exactly what she does and does not understand. The teacher's request in line 8 enables her to assess the student's understanding. The student appears to have a secure understanding of the postulate of freedom as articulated in lines 9 and 10. However, she is questioning the link which is assumed through the presentation of the text between freedom to do good and Kant's conclusion that there is an afterlife where virtue is rewarded.

The extract below develops from the one above, where there appears to be a complete reversal of teacher-student role, as the student engages in a series of moves (Eggins & Slade, 1997) which could be termed a Socratic questioning sequence (Lipman, 2003) resulting from her engagement with key ideas in the text. These moves are highlighted in bold italics in extract 20 and will be analysed further below.

Extract 20
1 T: Because it kind of links in with this, doesn't it? ((refers to
2 textbook))because it tells us that virtuous actions are not always
3 rewarded so ↑all he's saying is (.4) right, if you do a good action=
4 S13:= ***but what...what's the difference between perfect virtue and***
5 ***virtue?(I)***
6 T: Well, just perfect virtue is like the best version of it, isn't
7 it?***(R)***
8 S13: ***But how will we know what the best version is (F/I)***
9 T: Because you might be virtuous, you might be a good person but not all
10 the time, but perfect virtue would be you know, being virtuous all the
11 time **(R)**
12 S13: ***Yeah, but how would we know that? (F/I)***
13 T: We would know by the way that they're doing it based on their duty
14 and we would know, according to Kant= **(R)**
15 S13: =***but what if you] already did your duty but you kept getting like***
16 ***bad effects from it (F/I)***
17 T***:*** Yeah, and that's what he's saying sometimes that happens, sometimes
18 someone always does their duty and they always do the right thing and
19 they don't get rewarded, so he's saying perfect virtue deserves to be
20 rewarded so if it's not rewarded in this life, what do we have to
21 postulate then? **(R/I)**
22 S13: An afterlife **(R)**
23 T: Yeah (**F)**
24 ***S13: So the perfect happiness is heaven? (I)***
25 T: Yeah **(R)**
26 S13: ***So are they meant to link? (I)***
27 T: Yeah, they do link in the sense that you have to have God in order to
28 have heaven, don't you?
(Appendix U: L.27.3.13, p. 328)

In line 4 the student questions what she perceives as ambiguity between the terms 'virtue' and 'perfect virtue', and then questions the distinction offered by the teacher in line 8 in a

move that seeks further clarification or elaboration. This is replicated in line 12 , where the student indicates she is not satisfied with what might be seen as an explanation in abstract terms by the teacher, and seeks a concrete explanation or example through 'how would we know that?' The teacher's attempt to explain is interrupted by a further question by the student (l.15), which results in the teacher elaborating further on the rationale for Kant's moral argument. The teacher then resumes the initiative with a question to take the student through the steps of the argument. Student questions in lines 24 and 26 indicate she is making the connection between the two concepts of virtue and the conclusion that an afterlife must exist, according Kant's argument.

What these examples have served to illustrate is that the orchestration of this reciprocal teaching task appears to have provided students the time and 'intellectual space' to engage deeply and grapple critically with the meaning of a short yet complex text. It should also be noted that the stages required in this task included engaging with a text (reading), note making (writing), explaining to someone else through a discursive dialogue what has been understood (speaking and listening), and then reformulate what they have learnt into a formal essay paragraph as would be required by the exam(writing). What is also evident in the extracts examined above are instances of students engaged in a process of monitoring and evaluating their own understanding, thus illustrating a link between Critical Thinking and metacognition as explored in chapter two and which has featured in the previous data analyses (see chs.4&5).

iii) Student outcome

Whilst the data presented above is derived from Critical Thinking based processes, an example of a student generated critical thinking outcome in the form of a written paragraph for an essay will be examined below.

Extract 21

T: LET'S COME BACK TOGETHER. And M and D, can you read yours first, please.
S7: We said Kant's moral argument is an ***inductive*** argument as it leads to the probable conclusion that God exists ((reads from written work)) His argument is ***deontological*** […] Kant argues that with reason we can prove God's existence. With the three ***postulates*** of morality we can see the necessary existence of God. Kant argues we must have freedom to carry out an act if we are to be moral. If we have the perfect virtue it should lead to the perfect happiness which we do not achieve in this world. Therefore, an afterlife must exist...having virtue and happiness which is the Summum Bonum.

(Appendix U: L.27.3.13, p.329)

The references in lines 3-6 to ‘deontological’, ‘inductive’ and ‘postulates’ appear to indicate the student’s appropriation of the language of the discipline used in a fitting context. The presentation of the text also suggests a clear structure in terms of: two introductory statements (lines 3 - 5), which clarify the characteristics of the argument (inductive and deontological). This is then elaborated upon by referring to the three postulates which are then explained, leading to the final conclusion, as indicated by ‘therefore’ in line 10.

In this paragraph the student appears to be demonstrating her understanding of the lesson content by means of the rhetorical mode of argument required by A level philosophy. In this respect it could be argued that the processes involved in the reciprocal teaching episode seem to reflect the Critical Thinking processes/ critical thinking outcomes construct presented in this study whereby students have been engaged in Critical Thinking processes generated by the teacher’s orchestration of the reciprocal teaching task in order to support students’ secure understanding. This is then recontextualised by students into the rhetorical mode of a structured written argument, that is one of the critical thinking outcomes required by the A level exam.

However, whilst both pedagogical approaches explored here appear to facilitate students’ deep and critical engagement with content as indicated by the extracts examined above, it is also worth signalling here that the teacher’s response to such student engagement is not so facilitative across all lesson activities. A short example of one such incident will be used to illustrate the point.

In extract 22 below, the teacher is reviewing the events of the Genesis story in preparation for an examination of Augustine’s Theodicy.

Extract 22

```
1 T: You need to be really secure on the story in order to kind of
2 understand where he's[Augustine]coming from so just to quickly remind
3 ourselves, so we said it was the story of Genesis(.2) the world's created
4 (.) how was the world when God creates it?
5 S4: Good
6 T: Good, completely good, yeah, and yeah, go on
7 S2: You said that evil's there because of the Fall but He created the
8 serpent and the tree
9 T: Yeah, and that was one of the problems, yeah, so that's...that's a
10 good thought, hold that thought and we'll come back to it when we're
11 doing the critique, but just to explain the theodicy at the moment. So,
12 A, can you remember how ...what does...how do they use repetition in
13 Genesis, what's the bit they keep repeating?
14 S5: And it was good
15 T: they keep repeating that to make that idea everything God makes is
16 good em...it all goes wrong when (.4) what happens?
```

(Appendix V: L.19.4.13,p. 330)

The teacher's review of the events of the Genesis story is interrupted by a student comment in line 7 where he appears to be engaging critically with the content by raising an inconsistency, as he perceives it, in what he has been told. Although the teacher acknowledges the contribution (l.10), she appears to 'detach' it (Eggins & Slade) from the immediate context of the lesson by deferring the critique raised by the student to a later stage in the lesson as referenced by her use of the future tense, 'We'll come back to it when we're doing…' and then returns to the present tense to resume checking the narrative of the story in line 12. Ironically, as also indicated in M's case study, in an attempt to 'manage' students' engagement with such complex content, there are instances in lessons where students 'authentic' criticality rubs up against the priorities of the teacher, usually governed by the exigencies of the lesson and the exam. As illustrated here, it is the teacher who exercises 'topic control' (Fairclough, 1993) and appears to close down in these instances authentic student engagement with lesson content.

To conclude this section, the data generated by close reading and reciprocal teaching tasks serve to illustrate how L makes selective use of Paul's Critical Thinking strategies as a means of developing her students' ability to meet the critical thinking requirements of the A level specification, namely the mastery of complex conceptual content and the written production of well-reasoned argument. A further analysis of the teacher's construction of these tasks, alluded to above, shows that students are required to focus explicitly on their own understanding. In other words, the tasks require not just cognitive engagement but also metacognitive engagement by the students. As a result, the link between Critical Thinking and metacognition explored in the previous data chapters also pertains here. However, as also indicated in chapter four, such fostering of students' criticality needs to be seen within the constraints at play within an A level classroom.

6.3.2.3 The Intellectual Standards

A final feature of Paul's Critical Thinking model adopted by L is the 'Intellectual Standards'. In lessons observed she makes selective use of some of the Standards that she sees as relevant and makes those explicit to students in relation to the task they are about to undertake. Their presence as part of the resources L draws on could be said to be literally illustrated by the fact they are displayed in her classroom, as shown below in fig 6.2.

Fig 6.2 L's classroom displaying the Elements of Thought and Intellectual Standards

As will be illustrated below, there appears to be blending between this feature of the Critical Thinking model and the critical thinking requirements of the A level. It will also be shown that L takes a clear instrumentalist approach making a distinction between the Standards as 'tools' and what she understands as 'authentic ' Critical Thinking in the context of her subject.

An example of the explicit use of a selection of the Intellectual Standards in lessons below is taken from lesson one where several students offer the standards of 'accuracy' and 'precision' as part of criteria for evaluating the outcomes of the close reading task, as indicated by my bold italics,

Extract 23

1 T: What was that?
2 S5:***Precise***
3 T: Ahh! Fantastic word, ((teacher writes up on board)). What does
4 that mean?
5 S5: ***Accurate***
6 T: No, what's the difference? What's the difference?
7 S9: ***Precise is like when you say something like zero point zero***
8 ***zero zero point***

9 T: Yeah, ((laughing)) yeah, it is, it's like ...
10 S9: Ahh, and ***accuracy is just like, if something's correct***
11 T: Yeah, that's right, ok. So, precision is...***if I say …emm the***
12 ***pen's on the table***
13 S6: ***That's not precise***
14 T: That's not precise, ***how could I make that more precise?***
15 ((***Several students shout out***))
16 T: I could measure exactly where it
17 is on the table, that's right. and precise, there's a difference (.2)
18 and also (.) and accurate, ***so for***
19 ***example, we could just say Anselm***
20 ***says that (.3) em...like...like R did at the beginning*** and Anselm says
21 that ...em...so God exists ...or we could
22 make it more precise and go here's
23 the stages of the argument as to why
24 he thinks that … ***so you can't leave a stage out, ok?***
(Appendix T: L.4.3.13, p. 317)

A student offers term 'precise' as a criterion in l.2 but appears to confuse it with accuracy in l.5. Another student can illustrate the term 'precise' in mathematical terms (l.7) and distinguishes it from accuracy in l.10. The teacher elaborates further on the difference between the two and student responses (ll.13 & 15) suggest they are at least familiar with this terminology although it is the teacher who contextualises 'precision' for the topic at hand (ll.18-24). Precision is, therefore, understood in the context of Anselm's ontological argument by including each stage of the argument. As has been shown in observation data already analysed above, precision in understanding key concepts and the steps of the argument was a challenge for many students in the lesson, hence the teacher's constant reference to it when talking with individual students.

Another standard referred to in the context of criteria for assessing the written outcome of the close reading tasks is logic. Meeting the standard of 'logic', according to Paul, is characterised by one's answer to a series of questions such as:

- Does all of this fit together?
- Does this really make sense?
- Does that follow from what you said?
- How does that follow from the evidence? (Paul & Elder, 2008a, p.10)

As will be shown below, this language is echoed by students' explanations , illustrated through my use of bold italics, but it is interesting that the teacher uses the term 'coherent structure' instead of 'logic' as this is the term used in the exam specifications (OCR, 2010, p.81). As such, this small episode could be said to illustrate quite literally the blending of the Critical Thinking model and the A level specifications in the context of this subject, as will now be shown.

Extract 24
1 T: When we explain it (.3) what's our criteria? What am I looking for?
2 S6: […]Structure

3 T: When you say structure, what do you mean by structure?
4 S7: ***When you go from one point to another?***
5 T: Yeah, so it's...if I say coherent structure, what does that mean?
6 Because that's what they say in the exam (.4) specification. What does
7 coherent mean? (.5) Go on
8 S6: ***It's that like the things follow [so that***
9 T: Yeah]
10 S6: ***they make sense.***
11 T: It makes sense, yeah↑ It makes sense, the points follow on logically
12 from each other so it shouldn't...shouldn't be jumping about from this
13 point to this point, it has a (.) ok, good. What else?
(Appendix T: L.4.3.13, p.317)

Again, students appear to be comfortable with the use of structure as a criterion and also in terms of what it means, as indicated by student contributions in line 2 and line 4. The explanation given in lines 4, 8 and 10 appears to echo the language from the Critical Thinking materials, as shown above. However, the role of the exam in influencing the terminology used in this example is illustrated by the teacher's qualification of 'coherent structure' in line 5.

Indeed, L's attitude towards the Intellectual Standards is illuminated by an extract from her interview whereby she indicates a degree of ambivalence about such terms actually being 'Critical Thinking'. Her reference to them as 'terminology' and 'Critical Thinking terms' (highlighted below in bold italics) could suggest that she sees them more in terms of a metalanguage shared with her students rather than as inherent to her understanding of Critical Thinking from the perspective of her discipline..

Extract 25
1 L: And I use…sort of…the term…***the terminology*** on what...on what
2 they're trying to do so things about...talking about ***precision***
3 ***and accuracy*** ...em ... ***which isn't exclusively Critical Thinking***
4 ***but it is Critical Thinking terms*** that lots of us use so they
5 kind of recognise those. So I think, yeah… at A level those
6 are the main...the main ones that I would use. The Standards and
7 things like that I wouldn't use explicitly. I would (1.2) I would
8 probably ...but I would ...I would make it part of the em... for
9 example, when they're writing up a ...an essay plan, it would be,
10 you know, make sure you're being accurate, make sure you're
11 precise, say what you've...em.. you know, before you start, so I
12 would make them plan it out, and then I would use certain tools
13 in there ***but maybe not explicitly referenced as Critical***
14 ***Thinking.***
(Appendix S: L.25.2.13, pp.308-309)

Clearly L appears not to classify these as 'Critical Thinking' in the way she had identified Critical Thinking in her interview in terms of conceptual content and the evaluation and construction of argument (see p.128 above). It is possible to suggest that L sees Critical Thinking from a McPeckian perspective, as explored in chapter two, that is embedded within the very discourse of the discipline, and is, therefore, both process and outcome. In this context, L could be said to

characterise Paul's approach as providing pedagogical strategies or tools that serve to support 'active engagement' or 'active thinking' which she has identified her students as needing to do with the complex content of the A level philosophy course. Indeed, this distinction between content and pedagogy is hinted at in her interview where she refers to teaching 'in a Critical Thinking way', highlighted in bold italics below,

Extract 26
1 L:I know that I've got to cover this content. So, it's just trying to
2 …(hhh)...you know…because you have to cover the content but really...and I
3 know…I know ***you can teach the content in a Critical Thinking way,*** like...
4 you know like you teach...you do reciprocal teaching or you do an...so
5 there's still thinking in an active way.
(Appendix S: L.25.2.13, p.311)

The Intellectual Standards, then, as used by L in her lessons are a further example of her selecting particular aspects of the Critical Thinking model to address the specific challenges arising for her students in relation to the demands of the A level philosophy course. However, these are viewed very much from a pragmatic perspective, providing a metalanguage shared by her and her students which is shaped and determined by the requirements of the A level.

6.4 Conclusion to Case Study Three

In this chapter I have investigated the relationship between Critical Thinking and L's interpretation of the A level specifications for philosophy and ethics as translated into the pedagogical practices she employs in her AS classroom. Firstly, I examined through lesson data, interview, commentary data and documentary evidence the apparent link between philosophy, argument and Critical Thinking which suggests that Critical Thinking is more closely integrated into philosophy's subject content than is the case with other subjects featured in this study. L's clear assessment of the challenge this content poses her students is instrumental in influencing her selection and implementation of specific Critical Thinking strategies, notably close reading and reciprocal teaching, with some selected use of the Intellectual Standards. Observation data has indicated the effect the teacher's orchestration of such tasks has in surfacing and addressing student misunderstanding. Furthermore, the data also provided evidence of students engaging critically with the content and demonstrating some ability to monitor their own understanding. As a result, the link between

Critical Thinking and metacognition, as examined in chapter two, also appears to have been illustrated by lesson data presented here. I have suggested that my conceptualisations of critical thinking as discipline-specific critical thinking outcomes as prescribed by the A level specifications, and Critical Thinking as pedagogical Critical Thinking processes to support students in their attempts to work towards such outcomes are also evident in the data I have presented. However, as has also been signalled in chapter 4, such criticality is subject to the constraints imposed by the exigencies of preparing for the A level exam. The key factor running through the complexity of practices presented in these lessons is the agency of the teacher: it is she who, as a result of her interpretation of the A level specifications, has analysed and evaluated her students' needs, and then drawn on her own interpretation of Paul's Critical Thinking framework to construct contextually specific tasks to address those needs.

Before proceeding to a detailed discussion of the data from all three case studies, I will end this section of the thesis with a brief overview of the data that has been presented.

6.5 Summary of the Data Analysis: Critical Thinking in the Hands of Three Teachers

The purpose of this thesis is to explore teachers' interpretation and translation into practice of Critical Thinking based on Richard Paul's Critical Thinking model in the context of their A level teaching. The case study chapters presented here have shown how three teachers have interpreted Critical Thinking and translated it into their A level teaching practice across three different disciplines. There appear to be common elements of practice across all three case studies, but also significant areas of difference. The purpose of this section is to draw together the key features emerging from the data before moving into the discussion chapter (ch.7) where findings from the data will be explored in terms of my research questions, and with reference to the theoretical perspectives outlined in chapter two.

Firstly, all teachers appear to be engaged in a process of assessing students' needs in relation to the demands imposed on them by the A level exam. All teachers revealed a detailed interpretation of their respective A level specifications and assessment objectives and were able to articulate in precise terms the specific challenges their students faced in relation to the critical thinking outcomes required by their subject's A level exam: whether this be developing the skill of analysis and evaluation to develop answers to synoptic

questions (ch.4); securing deep and authentic mastery of complex scientific content (ch.5); or understanding conceptually abstract philosophical arguments (ch.6). Indeed, data in all three chapters serves to illustrate students struggling with the specific demands of the respective A level content. For all three teachers, it was this assessment of their students' needs that I would argue informed their approach to the use of the Critical Thinking framework. In other words, Critical Thinking appears to be have been drawn on pragmatically by the three teachers to meet the needs of the A level exam rather than being a pedagogic aim in its own right. However, as has been shown, the three teachers M, J and L differed in how they drew on the Critical Thinking framework.

Teacher M (ch.4) appears to have assimilated most comprehensively and systematically the Critical Thinking model and its language into his classroom practice: he has incorporated the Elements of Reasoning as a tool for turning factual information into analysis; the Intellectual Standards are embedded into a systematic approach to assessment of written work; and he has developed the use of Fundamental Concepts into the very language and approach his students adopt when engaging with propositional content to support analysis and evaluative argument. All three aspects of the Critical Thinking model appear to be blended into the very pedagogical regime he has constituted in his classroom, as opposed to stand-alone 'Critical Thinking activities'. As a result, Critical Thinking practices to support critical thinking outcomes, or the CT/ct construct explored more fully in the data chapters, appear to be the most pervasive from across the three case studies in the teaching embodied by M in his A level politics class.

Teachers J and L, as has been seen in chapters five and six, also select aspects of the Critical Thinking model based on an assessment of their students' needs, which are subsequently suffused into their teaching approaches. However, these do not seem to be as extensive as seen in M's data, nor an innate part, in themselves, of an integrated pedagogic approach as was seen with M. In this respect, it might be possible to say that L and J draw on the Critical Thinking model more functionally. J, for example, makes use mainly of the Intellectual Standards described in the Critical Thinking model by blending them with other pedagogical influences, notably that of Bloom's Taxonomy. He combines these to serve what he sees as a core pedagogical aim of making the thinking explicit in his classroom; as such, he draws on Bloom's Taxonomy to inform the structure and the language of his lessons into which is infused selected Intellectual Standards. He shares these explicitly with

his students to enable them to meet the requirements of the A level biology exam in terms of a deep and secure understanding of complex scientific content communicated accurately and precisely in the required written formats.

Of the three teachers, teacher L (ch.6) appears to be most ambivalent towards the model as constituting 'Critical Thinking': She challenges its very status at one point as 'Critical Thinking', making a distinction between the term used in Paul's model and what she sees as innate to her subject, philosophy which could be described as combining both Critical Thinking as process and critical thinking as outcome. Nevertheless, she has adopted specific teaching strategies from the Critical Thinking workshops she attended, notably 'close reading' and 'reciprocal teaching' which she has found as effective pedagogic tools in enabling students to address the difficulty they have in understanding the conceptual nature of the philosophical content they have to cover. She also draws on some aspects of the Intellectual Standards from the Critical Thinking model, but only to supplement those provided by the A level specifications, rather than engaging in the very specific process of contextualisation as seen in J and M's case studies (chs. 4 &5).

In addition to Paul's specific Critical Thinking model, whichever features were adopted, all three teachers demonstrated a commitment to collaborative practices as a means of allowing students the space and time to engage with dense and/or conceptually complex content through paired work or discussions. Again, as shown in the data, this was organised and framed differently, according to the different teacher. However, such an approach orchestrated by the teacher did appear to enable students to engage in critical reflection not just on the content itself, but also metacognitively in terms of monitoring their own understanding and taking a degree of responsibility for addressing any misunderstanding. However, as signalled in parts of the data, such autonomy is to be viewed within the constraints of the A level classroom, and where student independent thought appeared to rub up against the demands of the exam as determined by the teacher's lesson priorities, it was the latter which prevailed.

Finally, the wider point to be made from this overview is that Critical Thinking is not homogenous in nature but assumes a different hue in the hands of these three teachers. These differences may partially be accounted for in terms of the epistemic differences of the subject as contextualised by the A level, which appears to be borne out by the different difficulties students have with each subject, as referred to above; and also by the other

pedagogical influences and attitudes the teachers brought to their practice. Indeed, the key feature emerging from across the data is the agency of the teachers themselves in relation to Critical Thinking and A level teaching. All three teachers appear to have engaged in a critical process themselves of interpreting the Critical Thinking model and the appropriate A level specification, which they have blended together and, with other pedagogical influences, translated into pedagogic actions in their classrooms. This will now be examined more fully in the discussion chapter to follow.

Chapter 7 Discussion

(Please note that references to specific data extracts from the case study chapters will follow the convention of chapter number followed by extract number, so 4.4 will refer to chapter four, extract 4).

The focus of this research is to explore teachers' interpretation and translation into practice of Critical Thinking in the context of their A level classrooms, based on Richard Paul's trans-disciplinary model. This thesis, therefore, constitutes a narrative of three teachers' rendition of Critical Thinking in the context of their A level teaching; and it also serves, at a meta-level, as an examination of the processes in operation when a theoretical construct, such as Critical Thinking, is translated into practice in actual classrooms. I argue that the case studies presented in chapters four, five and six point to the fact such a rendition is a multi-faceted and dynamic one and, consequently, the complexity of what is happening cannot be reduced in my thesis to a single conceptual framework. For the purposes of clarity and coherence, therefore, the discussion of practice presented in this chapter will be framed in terms of my three research questions which had been informed by the issues relating to Critical Thinking taking root in the classroom, as examined in the Introduction. These included what the literature identified as a lack of clarity over what is understood by Critical Thinking and its application to a disciplinary context; a gap between theoretical perspectives and practical pedagogical applications; a focus on outcomes rather than on processes to inform those outcomes; and the apparent constraining effect on pedagogy of operating within a 'high stakes' assessment system. As explained in the Introduction (see pp.10-12), I synthesised these issues into my three research questions for this practice-based study as follows:

1. How do the participant teachers in this study interpret the term 'Critical Thinking'?
2. How do these teachers translate their interpretations of Critical Thinking into pedagogical practices in their disciplinary specific A level classrooms?
3. How does the context of teaching for high stakes AS and A level examinations with their associated disciplinary specific expected outcomes bear on the Critical Thinking pedagogical practices presented by these teachers?

Whilst each question provides a portal through which I examine specific and distinct findings from the data chapters, there is also a high degree of overlap across all three. Instances of such an overlap might be expected from a study which draws on the complex and dynamic nature of teaching in the context of real classrooms. I therefore need to draw attention to the fact that whereas each question focuses on a particular dimension of these teachers' work with Critical Thinking, it does not stand alone as a discrete aspect of their practice but is an artificial dissection of part of a wider, more coherent, symbiotic whole. My research questions are, therefore, an attempt to explore systematically the rich complexity of practice featured in this study, conscious that such practice will not always conform obediently to such externally imposed categories.

Given these caveats, the chapter is divided into three parts: firstly, I address the initial research question by examining teachers' disciplinary and practice-based conceptualisations of Critical Thinking within the context of Eraut's constructivist perspective of teacher learning and professionalism; I then, with reference to the second research question, address issues relating to disciplinary specific pedagogical practices, examining teachers' translation of their interpretations of Critical Thinking into practice as part of a wider pedagogic eclecticism within the context of Shulman's pedagogic content knowledge (PCK); and finally, in relation to question three, I use Bernstein's concepts of visible/invisible pedagogy and its associated term of classification as a heuristic with which to examine what appears to be a complex relationship between Critical Thinking pedagogical practices and critical thinking outcomes as determined by the high stakes A level exam. It is also in this context that the Critical Thinking 'dispositions' or 'virtues' called upon by Critical Thinking theorists, as discussed in the theory chapter (ch.2), and what I called 'critical qualities', are examined in the context of the A level classrooms featured in this study.

Finally, as referred to in the methodology chapter (ch.3), in this chapter I adopt an etic position by attributing the findings from the data a significance with reference to relevant theoretical perspectives examined in part two of the theory chapter, notably Eraut's constructivist conceptualisation of teacher professionalism; Shulman's pedagogic content knowledge (PCK); and Bernstein's concepts of visible and invisible pedagogies. However, this discussion will, in keeping with the primary concern of this thesis, be led by practice, with theoretical perspectives being drawn on as determined by practice and as a means of

illuminating such practice, rather than the discussion of practice being constrained by a particular conceptual frame.

7.1: How do teachers in this study interpret the term 'Critical Thinking'?

As was shown in the data chapters (chs.4-6), and will be elaborated upon further below, teachers' conceptualisation of Critical Thinking in this study is linked closely to their class based practice which appears to be inherently linked to their subject area, as opposed to abstract, theoretical constructs. In this section, therefore, I argue that teachers appear to have engaged in a process of developing their own situationally relevant conceptualisations of Critical Thinking informed, on one hand, by the nature of their discipline, as represented by their A level specifications, and also by other professional propositional knowledge (Eraut, 1994) and personal theories (O' Hanlon, 1993) they bring to their practice. In all cases, these teachers' conceptualisations of Critical Thinking appear to be driven by the demands of the nature of their respective A level, rather than being a pedagogical aim in its own right.

As the data illustrated, all three teachers were able to give a clear articulation of what they understood by 'Critical Thinking'. However, that these conceptualisations were not identical, even though they had all undergone the same Critical Thinking training programme, indicates a process of contextualisation taking place. Their conceptualisations, at one level, appear to be a product of blending Critical Thinking with the context of their discipline which, in turn, is embedded within a further layer of contextualisation as presented by the A level specifications of the subject. So, as shown in the case studies (chs.4-6), M sees Critical Thinking in politics as an ability to relate different forms of evidence from case studies to key political concepts 'to show they can think politically' (4. 1). Thus his definition of Critical Thinking is localised in terms of the subject as 'thinking politically' and the way it is determined by the exam in terms of relating evidence to political concepts. L perceived her whole philosophy and ethics course as Critical Thinking (see p.128 above) composed of engaging with conceptual philosophical content and the development of philosophical argument (6.2); and finally, J positions his metacognitive conceptualisations of Critical Thinking clearly in the context of being a teacher of A level biology where he defines it at one level as linked to what he sees as his role in making the types of thinking required by the exam explicit to students (5.3), and inculcating in his students an ability to assess the quality of their own thinking (5.4).

In addition, these conceptualisations are not only informed by teachers' disciplinary context, but also appear by their own personal propositional knowledge (Eraut, 1994) or personal theories (O' Hanlon, 1993). In this way, J blends his understanding of Critical Thinking with Bloom's taxonomy, making explicit reference to Bloom's in terms of his metacognitive conceptualisation of Critical Thinking (5.3; 5.7); and L makes her own distinction between Paul's 'Critical Thinking terms' and teaching in a 'Critical Thinking way', on one hand, and 'Critical Thinking' per se, whereby she questions whether Paul's model actually constitutes Critical Thinking (6.25; 6.26), on the other. Indeed, L appears to see Critical Thinking from a McPeckian perspective, as examined in the theory chapter (ch.2), being embedded in the very epistemology of her subject in the form of assessing and producing philosophical argument (6.1). As such, drawing on Eraut's (1994; 1998) constructivist perspective of teacher professionalism, teachers here appear to be absorbing the public propositional knowledge known as Critical Thinking into their own personal propositional knowledge which will play out into their action knowledge (Eraut, 1994) in the classroom, as will be discussed further in part two below.

A further dimension to be considered in this examination of teachers' conceptualisations of Critical Thinking is the apparent nature of the dynamic between Critical Thinking and the subject A level specifications, which does not seem to be one of equal weighting. From the teachers' perspectives, Critical Thinking, as they conceive of it, is drawn on to serve the requirements of the exam, or more specifically, as will be examined in relation to question two below, to address the needs of their students, as the teachers assess them, in terms of the requirements of the exam. Indeed, as developed further in the third part of this chapter, Critical Thinking, as these teachers render it, ceases to be visible, but is, rather, blended into the knowledge base of the subject as embodied in the curriculum requirements of the A level syllabus. This appears to be reinforced by the fact that none of the teachers claims to be explicitly teaching Critical Thinking per se. So, although M's students are familiar with terms from the Critical Thinking model such as 'The Standards' and 'Fundamental Concepts', thinking 'critically' is replaced in his conceptualisation as thinking 'politically' (4.1). In other words it is seen as a means of thinking their way through the discipline. In this way, M is probably the closest of the three teachers to the spirit of Paul's trans- disciplinary articulation of Critical Thinking, as outlined in the theory chapter (ch.2), where it was claimed his model should serve to uncover for students the nature of a discipline. Nevertheless, M's students

are not told overtly that how they are working is a 'Critical Thinking way'. J made his 'non-use' of the term 'Critical Thinking' explicit in his interview, acknowledging that his students might not be aware of 'doing' Critical Thinking, although he claimed they would be aware of 'types' of thinking linked to Bloomisan terminology in the context of the A level biology exam (5.15). L, in her use of Critical Thinking, acknowledges she draws on certain tools but clarifies that these are not openly referenced as Critical Thinking, and, indeed, as referred to above, she voices her own scepticism as to whether Paul's model actually constitutes 'Critical Thinking' (6.25; 6.26), a concept which she sees as inherent to her subject in terms of argument analysis and evaluation on one hand, and argument production on the other.

It is evident, therefore, that these teachers do not seem to be working to a dictionary definition of Critical Thinking but their understanding of it is blended with, and could be said to be subservient to, the nature of their subject as represented by the A level exam, amalgamated with other professional perspectives they bring. In other words, it could be said that these teachers are engaged in a process referred to by Moon (2008) in chapter two (p.37) of developing local definitions of Critical Thinking applying to local situations between teachers and learners.

To summarise, the teachers in this study provide evidence of having undertaken an intellectual process of constructing their own conceptualisations of Critical Thinking which constitute a blending of their interpretation of the Critical Thinking model, their A level specifications, and other personal propositional knowledge or personal theories they bring to their professional context. As a result, these teachers appear to have produced their own conceptualisations which could be said to assume 'situationally appropriate forms' (Eraut, 1994, p.20). The interplay between these conceptualisations and pedagogical practice as enacted in their A level classrooms will now be examined in relation to questions two and three below.

7.2: How do these teachers translate their interpretations of Critical Thinking into pedagogical practices in their disciplinary specific classrooms?

As was signalled at the start of this chapter, and as will be shown, research questions one, two and three are inextricably linked, with a clear interrelationship between Critical Thinking and disciplinary concerns in terms of the teachers' interpretation of Critical Thinking and their pedagogic enactment of it. In this section, as a means of addressing my second research

question, I examine three specific yet interrelated areas: teachers' assessment of student difficulty; how this assessment informs decisions over pedagogical choices in relation to Critical Thinking; and teacher agency.

Whereas the issues identified in the Introduction referred to a disjuncture between theoretical conceptualisations of Critical Thinking and practical applications, the discussion in the first part of this chapter above has indicated how teachers in this study have interpreted for themselves Paul's Critical Thinking model to inform their own different practice- based conceptualisations of Critical Thinking. The differences in these conceptualisations are also borne out by how teachers draw on the Critical Thinking model to inform their pedagogical practices. However, a key and common factor across all case studies in determining teachers' pedagogical choices in relation to the model is their assessment of what their students find difficult in relation to the demands of the A level in their subject. In other words, they could be said to be engaged in what Shulman (1986) would call from a PCK perspective, mediating the relationship between disciplinary knowledge, in the context of the A level, and pedagogical knowledge, in terms of their practice. It is in this context that teachers seem to be drawing on Critical Thinking model pragmatically and selectively to address specific difficulties their students have in meeting the outcomes required by their subject's A level specifications. Indeed, it could be argued that, the ontological/epistemological interface claimed for Paul's Critical Thinking model in chapter two (see pp.24-25 above) manifests itself in practice through the way teachers appear to engage ontologically with selective features of the Critical Thinking model to support their students in developing an epistemological understanding of the subject as framed by the A level. However, in the manner in which these teachers do this, they demonstrate a degree of professional independence (Leung, 2013) and intellectual agency (Elliott 1993; Cochrane & Lytle, 2009) in the pedagogical choices they make, albeit within the confines of an externally imposed curriculum and assessment criteria in the form of the A level specifications. These interrelated ideas of student difficulty; Critical Thinking based pedagogical practices; and teacher agency will now be discussed more fully.

7.2.1 Student Difficulty

A common theme arising from all case studies is the difficulty or challenges presented to students by aspects of the A level specifications which appear to be related to the

epistemological features of the discipline, whether this be: developing the skill of analysis and evaluation to develop synoptic questions to demonstrate an understanding of the nature of different perspectives in political debate (ch.4); securing deep and authentic mastery of complex sequences and causal relationships which characterise biological processes (ch.5); or understanding conceptually abstract philosophical arguments (ch.6). For all three, given that a tight relationship between teachers' selection and use of the Critical Thinking model and specific requirements of the A level was seen in the data chapters, it can be argued that it is this assessment of their needs that informed their approach to their use of Paul's framework.

As identified in the theory chapter (ch.2), the difficulty students experience appears to be partly the consequence of a curriculum based on strong classification where the content of pedagogy in such a context, according to Bernstein (2000), consists of a transition from concrete to more abstract operations within the discipline. It is possible to suggest, from the teachers' commentaries on the nature of the A level and difficulties students experience, that A level is a marker of such transition. Students' difficulty with the complexity and quantity of content was identified by teachers' own reflections where, for example, J commented on students struggling to convert scientific knowledge from explanations or from the textbook into authentic understanding (5:6) which was also illustrated by student responses (5.16). M identified the difficulty students had with marshalling analytically the amount of content in the A level syllabus in order to develop cogent argument in response to synoptic questions (4.8). L in particular identified the challenged posed by the move from concrete understanding of religious practices across different faiths for GCSE Religious Studies to a much more conceptual perspective within the framework of formal philosophical argument at AS and A level. L also identified specific difficulties students had with understanding the concept of inductive and deductive arguments (6.3; 6.4). This was clearly illustrated in lesson data by students' attempts to understand the critique of Anselm's ontological argument (6.8), as well by initial student responses to Augustine's theodicy (6.14).

What teachers seem to be doing in their selection of Critical Thinking tools to address specific difficulties aligns with Shulman's concept of PCK as explored in chapter two In other words, to build on the explanation offered by Leung (2013, see ch.2) these teachers are engaged in a process of not just analysing content information students need to master but also analysing the nature of the higher order skills, or what has been referred to as critical

thinking outcomes in the data chapters, required by the A level specifications. As such, these teachers demonstrate an understanding of precise epistemological difficulties and associated misconceptions posed by the subject for their students. It is this analysis that informs teachers' selection of aspects of Critical Thinking to develop appropriate teaching and learning activities to directly address these difficulties. In this way, the Critical Thinking model appears to be drawn on selectively by these teachers as part of the process of converting disciplinary knowledge into the their pedagogical repertoire.

In other words, each teacher, as shown in his/her interview and reflexive lesson commentaries deploys Critical Thinking terminology as a means of capturing what they are trying to do pedagogically to support their students' acquisition of relevant content and skills required by their respective A level. It is in this sense, as will be illustrated below, that teachers appear to draw on Paul's Critical Thinking model ontologically through their use of its terms and associated definitions intended to describe Critical Thinking that they then interpret in the context of their own A level specifications and student needs, leading to their own situationally relevant enacted pedagogy.

7.2.2 Pedagogical Practices Informed by Paul's Critical Thinking Model

In this section I discuss teachers' pedagogic rendition of specific features of Paul's Critical Thinking model to address the disciplinary difficulties referred to above. Mindful of my caveat at the start of this chapter of an interrelationship between all three research questions, I am aware that this, initially, may suggest an artificially simplistic relationship between Critical Thinking as pedagogic process to enable students to meet the critical thinking outcomes identified in their respective A level specifications. Indeed, I acknowledge that practices featured in this section constitute a partial picture of the wider pedagogic practices presented in the case studies, where such Critical Thinking activities were also housed within a discursive or collaborative approach to teaching and learning which, as examined in the theory chapter, are deemed to be more likely to foster the development of Critical Thinking (See ch.2, p.30). For the purposes of clarity, therefore, I will examine here teachers' pedagogic practices derived from Paul's tri-partite model as presented in the theory chapter and how they relate to their students' difficulties identified above. However, the further implications of infusing these practices within a collaborative and discursive classroom culture, which appears to yield a seemingly more complex interrelationship between Critical

Thinking pedagogical processes and critical thinking outcomes, will be explored more fully in part three below.

Of all three teachers, M appears to have integrated the Critical Thinking model most systematically and holistically into his approach to teaching. Nevertheless, as with the other teachers, as shown in his data, his use of it serves the requirements of the exam and the specific challenges they present his students, especially in relation to analysis and evaluative argument. This is illustrated by his reflection on his use of the Elements to support students in moving from description to developing analytical engagement with new subject content to aid with subsequent argument (4.6); the use of Fundamental Concepts to support students' ability to manage a vast body of knowledge and to help structure analytical thinking, especially in the context of developing arguments in response to synoptic questions (4.8;4.9); and the Standards as a framework for analysis and evaluation of the quality of their written responses in preparation for the A level exam (4.13).

J's use of the Critical Thinking model is not as pervasive as M's, but, again, when it is drawn on, it is subservient to the needs of his students in terms of the A level exam requirements, notably the need to have a secure mastery of complex conceptual content related to biological and bio-chemical processes. So, for example, his use of the Standards, as with the other teachers, assume a subject specific identity, taking on a highly indexicalised form in relation to their application to specific A level biology exam questions, (5.11; 5.12). He does not draw on the Elements as he does not see these to be directly relevant to the needs of his students as he identifies them (5.15), indicative of Elliot's (1993) point that relevance is also a contextual factor in determining the nature of a teachers' engagement with theoretical models.

However, J's practice serves to highlight a blending process with which teachers are engaged in terms of their use of Critical Thinking in their classrooms. He draws heavily on Bloom's taxonomy as part of his wider pedagogical repertoire and amalgamates this with Critical Thinking, especially in relation to the Intellectual Standards. This was illustrated in the data particularly well (5.7; 5.9; 5.11) where students were given very clear instructions in operationalised terms about 'comprehension', 'recall ' and 'application' tasks in Bloomsian terms but where these were also framed in relation to the Standards of 'accuracy', 'breadth' and 'depth'. These were also explicitly rendered into subject specific terms relating to the

quality of answers required by the A level notably in terms of the ability to draw on a secure understanding of the biological processes under study.

Finally, L's choice of the pedagogical tools of reciprocal teaching and close reading is rationalised in the context of the specific difficulties she had identified. However, her commentary on her orchestration of these tasks also indicates a flexible tailoring of a pedagogical approach, so that she also uses reciprocal teaching as an activity not, in the first instance, to secure clear understanding, but as a step in a process, as a means of priming her students to prepare them to explore the content further, ' …if you've tried it, and you don't understand what a predicate is and then I explain it then they kind of…then go back over it…' (6.17). This is a precise example of a teacher demonstrating a more nuanced understanding of the nature of the difficulty, drawing on an aspect of the Critical Thinking approach, and modifying its use to serve a very specific purpose, that of raising a form of cognitive dissonance, making students aware of something they are not sure of and, consequently, according to L's interpretation, being more 'receptive' to the teaching to address it.

To summarise, teachers have drawn on Paul's Critical Thinking model ontologically as illustrated through their own contextualised use of its terminology when talking about their own A level teaching practices which are, in turn, informed by the teachers' own discerning and judicious selection of what they deem as relevant features from the model. Indeed, that this is not a wholesale application has been demonstrated with illustrative examples including: J's combination of Blooms with some of The Standards; M's use of the Elements, Fundamental Concepts, and Standards blended with his understanding of the requirement of 'analysis' and synopticity as presented in the A level specifications; and L's selective and tailored use of specific pedagogical approaches. Teachers' overriding priority appears to be that of ensuring their students can meet the demands of the A levels; as such these teachers are engaged in a nuanced process of assessing the particular challenges posed epistemologically by the outcomes required by the subject at A level, and then developing pedagogical practices to address these challenges, to which Critical Thinking makes a contribution. Indeed, the common factor running through the complexity of the processes of interpretation and translation featured so far in this discussion is the agency of the teachers. This will now be addressed explicitly in the final section of this part of the chapter.

7.2.3 Teacher Agency

Although working within the confines of an externally imposed curriculum and a high accountability framework, as examined in chapter two, teachers in this study demonstrate a degree of agency in terms of their choice on *how* to teach. This agency or 'independent professionalism' (Leung, 2013) has been manifested through their acts of interpretation of Critical Thinking, A level specifications, and other resources, as outlined above, and is also evident in the translation of such interpretations into practice, as will now be illustrated below.

It was seen, for example, how J had made a concerted effort of developing a routine use of the Standards in the structuring of teaching tasks and also in terms of his approach to questioning (5.10); similarly, as referred to above, M's own development of his concept map for A level politics and his particular systematic approach to assessment through peer critique, drawing on the Standards, are further examples of such agency (4.9; 4.14; table 4.2). Finally, L clearly demonstrates her sense of agency in her decision to spend more time on detailed examination of short complex texts, rather than just ensuring 'coverage' at the expense of secure understanding (6.16) and also in her interpretation and application of 'reciprocal teaching', as outlined above, which is tailored to meet the needs of her students as she interprets them (6.17). Furthermore, she articulates her own clear positioning of Paul's Critical Thinking framework as a pedagogical resource (6.10; 6.25) as separate from the Critical Thinking as both process and outcome that she sees as inherent in her subject (see p.128 above).

I would argue that such examples are indicative of teachers not 'implementing' the A level specifications or the Critical Thinking model, but exercising a degree of professional and intellectual engagement in formulating their own professional enactment of Critical Thinking and the A level, illustrative of what Leung (2013) characterised as 'independent decision making' in the theory chapter. Furthermore, it could be argued, the work these teachers have undertaken also represents to some extent what was examined in the theory chapter as 'minor acts of knowledge creation of their own' (Eraut, 1994, p.47). This is illustrated by M who takes from the Critical Thinking framework, the concept of 'Fundamental Concepts', as examined in chapter four, but renders them into highly contextualised forms for the purpose of analysis and argument generation, embedding them systematically into his teaching with apparently discernible impact on students' ability to function 'analytically' in the

context of the A level unit on US politics (4:8). What this also brings to students in terms of developing 'invisibly' wider competences and dispositions will be examined further below in relation to the final research question. What is relevant here is that such concepts and their use are of this teacher's making, and are an indication of this teacher exerting his own professional and intellectual agency in the context of Critical Thinking and the A level specifications. As such, they could also constitute an act of knowledge creation and contribute to M's local conceptualisation and manifestation of Critical Thinking. Similarly, J's blending or combining of Blooms, the Critical Thinking framework and the A level specifications, could be said to be evidence of his own professional and intellectual agency leading to a highly contextualised synthesis of all three frameworks (Critical Thinking, Bloom's taxonomy, A level specifications) suggestive of a further example of a 'minor act of knowledge creation' (Eraut, 1994, p.47).

To conclude this section, Critical Thinking does not seem to exist independently of the subject nor the A level. Indeed, Critical Thinking appears to present itself as something quite malleable in the hands of these teachers whereby they select aspects of the framework, blending it with others, where appropriate, to make the requirements of the A level explicit and accessible to students and by doing so, they are engaging in an independent intellectual process of their own in which they are able to exert their own sense of agency. As such, what appears to drive these teachers is not 'fidelity' to the Critical Thinking framework but rather a pedagogy that enables students to produce outcomes required for success in the exam.

Indeed, as signalled at the start of this part of the chapter, these contextualised pedagogic renditions of Paul's framework took place within classrooms characterised by distinctive discursive cultures. This context adds a further layer of complexity when examining the pedagogic features of the practice presented in this study, and suggests a more complex relationship between Critical Thinking as pedagogic process and critical thinking outcomes as required by the A level specifications. It is in this context that I draw on selected concepts from Bernstein's work as a lens through which to help uncover and explore this complexity in response to my final research question.

7.3: How does the context of teaching for high stakes AS and A level examinations with their associated disciplinary specific expected outcomes bear on the Critical Thinking pedagogical practices presented by these teachers?

The final points to be examined here in terms of the pedagogical issues for Critical Thinking raised in the Introduction consists of a tendency within the field of Critical Thinking to focus on critical thinking as defined in terms of a set of outcomes rather than on pedagogical approaches to support such outcomes; and the perceived limiting effect on developing the skills and dispositions for such thinking in the context of a high stakes assessment culture. As examined in detail above, there has already been evidence provided of teachers engaging in a process of drawing on selective aspects of Paul's Critical Thinking model to address particular difficulties their students experience in relation to the disciplinary specific demands of their respective subjects at A level. Therefore, aspects of this question were already featured in response to question two above. However, as was also signalled above, there are additional aspects of pedagogical practice to be examined which indicate a more complex relationship between Critical Thinking as pedagogical process and critical thinking as outcome. Indeed, I argue that that the practice featured in this section serves to illuminate and explicate further how aspects of Critical Thinking are integrated into the process of inculcating in students the means by which they develop the skills and dispositions required to achieve such outcomes.

It is at this juncture that I draw on Bernstein's concepts of strong disciplinary classification and associated terms of visible and invisible pedagogy as a heuristic to help examine further the ways in which the three teachers in this study interpret and draw on Critical Thinking in relation to the outcomes as stipulated in their A level syllabus. Nevertheless, in this part of the discussion, I follow Bernstein's own view , as discussed in the theory chapter that the dichotomous distinctions between invisible and visible pedagogies are not meant to be absolute categories,

> '*These generic types [visible/invisible pedagogies] can take either progressive, conservative or radical modalities and that theories of instruction will act selectively on both the "what" and "how" of any pedagogic practice'* (Bernstein, 1990, p.70).

However, for the purpose of this thesis I will focus on the concepts of visible and invisible pedagogies as a means of examining teachers' mediation of their A level specifications and its stipulated critical thinking outcomes with Critical Thinking pedagogical processes aiming to support such outcomes. Indeed, as will be examined below, the "what" of pedagogic

practice in terms of A level outcomes, embodied in the A level specifications, remain highly visible throughout teaching. Yet, in order to achieve such outcomes, in other words the "how" of pedagogic practice, these teachers develop Critical Thinking processes, which will be shown to tend to move from visible to invisible pedagogy, or an amalgam of the two. As a result, there appears to be a complex and, at times, paradoxical, interplay at work between visible pedagogy and invisible pedagogy in the blending of A level with Critical Thinking in the classrooms featured in this study.

I argue below that the practice featured in this study did reveal parallels between the role of externally imposed curriculum demands in terms of A level outcomes and the pedagogy deployed to ensure students achieve these, with Bernstein's concepts of strong classification and its associated visible pedagogy. However, as will also be explored below, a closer examination of teachers' practices evident across the three case studies reveal a more complex interplay between visible and invisible pedagogies in which teachers appear to foster tacitly particular skills that appear to be a pre-requisite for the critical thinking outcomes of the A level. Notably, this appears to be achieved through teachers systematically drawing on the Critical Thinking model as a form of meta-language with which to make learning *processes* explicit blended with socio-constructivist classroom practices, as will be elaborated upon below.

Furthermore, I suggest that through the pedagogical approaches adopted, teachers also appear to promote 'invisibly' amongst their students particular learning dispositions or critical qualities that could be said to be evidence of a practical class-based manifestation of the 'Intellectual Virtues' referred to by Critical Thinking theorists in chapter two. Indeed, I argue that it appears to be at this juncture where visible and invisible pedagogies paradoxically come together in that the highly visible critical thinking outcomes of the A level specifications require students to possess such dispositions or critical qualities, which can *only* be invisibly fostered, in order to achieve such outcomes.

7.3.1 Critical Thinking, Strong Classification and Teachers' Practice as Visible Pedagogy

As was explored in the theory chapter (ch.2), Bernstein (1990; 2000) links strong subject classification with a performance model of education, achieved through a visible pedagogy that is characterised by highly visible curriculum content, evaluation criteria, and strong

teacher control of the sequencing and the pace of learning. The concepts of strong classification and visible pedagogy help to examine what is happening with these teachers' interpretation and use of Critical Thinking and its role in terms of promoting critical thinking outcomes. In the context of this study, strong classification is embodied in the A level subject specifications, with clear subject content to be covered and where Critical Thinking is embedded in disciplinary terms as articulated in the assessment objectives and grade descriptors. Indeed, as has been explored in the data chapters (chs.4-6), the A level specifications lay out explicitly what I have termed critical thinking outcomes as part of their assessment objectives and performance descriptors (4.2; 5.1; 6.1). In such a context, strong classification, as outlined in chapter two, is seen to engender visible pedagogical practices, and this appears to be the case, to some degree, in the data presented in this study.

As has been discussed in relation to question two above, all three teachers prioritise content and performance, as stipulated by the A level specifications. Indeed, the uncontested status of the exam, as presented in the data chapters, was reinforced through teachers' use of the language of obligation, in terms of what students 'should' or 'need' to do (4.3; 4.15; 5.2; 6.2) and it is these which, as has been shown above, inform teachers' use of Critical Thinking. Therefore, there appeared to be a strong focus on performance and production in all case studies of what Bernstein (2000, p.45) terms 'pedagogic texts' (see ch.2), which, in essence, ***is*** the students' performance (Bernstein 2000). M, for example, in his interview, clearly outlines what students need to be able to produce to meet the assessment objectives of the exam specifications (4.1; 4.3) in terms of mastering a range of factual information, and to analyse and produce sustained evaluative argument. Furthermore, it was seen in lesson data how embryonic forms of reasoning were promoted through his use of the Elements (4.7) and how his use of concept maps supported his students' ability to articulate arguments from alternative points of view, as well as formulate their own arguments (4.10; 4.12 & table 4.1). In other words, M draws on Critical Thinking tools such as the Elements and Fundamental Concepts to support students in developing the ability to meet these requirements and produce the appropriate pedagogic texts in the disciplinary context of A level politics. Similarly, J's use of the Standards blended with his interpretation of Blooms, as outlined above, show a very tight relationship between his use of Critical Thinking with the requirement of the exam, notably the nature of the pedagogic texts needed in terms of the type of written answers required. This is particularly well illustrated in the data where student

questioning on sliding filament theory (5.18) leads to the student eventually producing written notes, i.e a pedagogic text, in the format required by the exam, indicating a logical sequence of biological processes making explicit the causal links between each step in the process (see fig. 5.8 above). Similarly, L's use of the reciprocal teaching approach leads to students eventually attempting to reproduce Kant's moral argument in their own words but upholding the terminology and rhetorical mode of argument required by AS level philosophy and ethics (6.21). As a result, the primacy of the A level, notably in terms of the outcomes or performance it requires, is evident a cross all three case studies, with Paul's Critical Thinking model being drawn on to support the achievement of such outcomes.

Furthermore, the highly visible presence of evaluation criteria serves to highlight the authority of the A level assessment criteria across the practice in this study. As was shown in the data chapters, students were made aware at all times of the criteria for a piece of exam writing, or a type of question, mainly through teacher's articulation and contextualisation of the Standards, with explicit reference and use of the exam mark scheme or assessment objectives (Table 4.2; 4.15; 5.11; 6.23; 6.24). In fact all three teachers appear to reinforce the primacy of performance by drawing on Critical Thinking tools to address what was 'missing' in relation to the performance criteria set out in the exams. So, for example, M's peer critique task drawing on the Standards to address the quality of written answers or 'pedagogic text' draws on the language of 'deficit', (4.16); with J using such language explicitly in the context of his use of the Standards,

> ' I've been trying to use those Critical Thinking words when you're trying to describe to a pupil what's ***missing*** in their answers' (my emphasis) (5.13).

That such a stance appears to have been adopted by students is further illustrated by a student exchange with J about one of her answers, where she was able to specify what was missing in her answer with reference to the 'expected' pedagogic text as presented through the exam board's mark scheme (5.14).

A further shared feature across the case studies that appears to align with a visible pedagogy is that of strong teacher authority. Indeed, in the context of these lessons, teachers were the ones orchestrating lessons through setting up tasks, determining the pace of time spent on them and controlling the feedback. Teacher control was evident in the language they used, for example, in M's authoritative use of the 1st person, 'the way I do assessment' (4.13) and through J's directive language in setting up the way students will

approach their revision tasks, ‘ you’re going to work through your identified area, you’re going to work through these steps…’ (5.7).

To summarise, from a first examination, the teachers’ practice presented in this study appears to be strongly focussed on critical thinking outcomes as determined by the exam specifications. As a result, it appears to align to an extent with several features associated with Bernstein’s performance model and associated visible pedagogy. In other words, there is a notable focus on the production of ‘pedagogic texts’ as embodied by the exam specifications, highly visible curriculum content and evaluation criteria with strong teacher control. However, on closer examination, teachers, to differing degrees, appear to demonstrate elements of invisible pedagogic practice in combination with those characteristic of visible pedagogy as a means by which such critical thinking outcomes are fostered amongst their students. This will now be examined in further detail.

7.3.2 Critical Thinking as Process: A Tendency towards Invisible Pedagogy

As was examined in the theory chapter, if visible pedagogy is associated with a focus on performance, invisible pedagogy, as originally conceived by Bernstein, focussed on the development of ‘competence’ with an emphasis on ‘ways of knowing’ (Bernstein, 2000). It is at this juncture that we encounter what could be termed a pedagogical paradox in terms of the critical thinking outcomes prescribed by the A level specifications as both visible and invisible. I would argue that a correlation could be drawn between Bernstein’s concept of competence as ‘ways of knowing’ and the critical thinking outcomes required by the A level specifications which, as explored above, are at the same time also highly classified and visible. In other words, although the critical thinking outcomes from A level specifications as featured in the data chapters (chs.4-6) such as ‘critical evaluation’ (ch.5); ‘ analyse and evaluate arguments’ (ch.4); ‘justify a point of view through reasoned argument’ (ch.6) are explicit, visible features of the classrooms in this study, they are not outcomes or ‘answers’ which can be ‘transmitted’ or ‘delivered’ by teachers in a traditionally ‘visible’ approach. Rather, they are the result of skills and critical qualities which need to be inculcated or fostered invisibly over time. As will be explored below, the data appears to provide elements of such invisible pedagogy blended with the visible pedagogic practices referred to above. These consist of particular Critical Thinking practices examined in the theory chapter (ch.2) associated with metacognitive and socio-constructivist approaches. Although I will

address these separately, it seems to be in the blending of these two approaches that teachers, over time, appear to foster the opportunities for students to rehearse, practise and develop the skills required to achieve the outcomes required by their A level specifications

7.3.2.1 Critical Thinking as a Meta-Language to Support Critical Thinking Outcomes

Across all three studies, teachers draw on the Critical Thinking model to develop a shared meta-language with which they talk explicitly to their students about their learning and through which students consciously rehearse the means to 'operate' in the subject in order to meet the outcomes required by the A level specifications. In this way, practice in this study appears to support the theoretical link made in the theory chapter (ch.2) between Critical Thinking, metacognition and pedagogy (Halpern, 1998; Dean & Kuhn, 2003). Drawing on Bernstein's visible/invisible heuristic, this approach might share features of visible pedagogy, in the manner that ways of working are made explicit and visible to students through the processes teachers orchestrate and the language they use to accompany such processes. Yet, I would argue that this metacognitive approach acts more like a bridging tool from visible to invisible pedagogy in that, once set up, students are 'released' to work independently of the teacher, often within a context which supports collaborative talk as a means of processing, trialling, rehearsing the approach made explicit to them and thus, over time, enabling them to become more adept in acquiring the skills required to meet the required A level outcomes. This will now be elaborated upon with further reference to the data. Teachers in this study do not just make explicit assessment or evaluation criteria, as in Bernstein's performance model, but operationalise these, drawing on aspects of the Critical Thinking model, to make explicit to students not just the criteria for the outcome, but what could be termed procedural criteria for how to achieve such outcomes. For example, J operationalises the Standards (5.11; fig. 5.2) in the form of very specific questions students can ask of themselves relating to the detail, precision, terminology and logical sequencing required in exam answers. As was examined above, he combines this with his operationalisation of Bloom's taxonomy in relation to revision tasks, (5.7; 5.9), a combination which results in providing students with a procedure to adopt for revision for the A level biology exam, which potentially could be applied to revision per se in any context. Similarly, M makes it clear in his interview, corroborated through lesson data, how he shares his concept map explicitly with his students, 'I try to be quite explicit with sharing that with

students *so that they can build up their own conceptual framework'* (4.9) (my emphasis). As a result, it could be suggested that here M is making an explicit link between a metacognitively driven pedagogic choice and his aim of inculcating in his students an ability to develop over time the skill of independent analysis. Furthermore, it could be argued that his students are developing an understanding not just of the specific concepts used for the topic of US politics for the exam, but are being inducted invisibly into thinking conceptually per se. Students appear to know and understand the specific concepts linked to their topic, as illustrated by their fluent and independent use of them seen in lessons, as a means of organising their understanding into analytical frames (4.10; 4.11). This could, at one level, be seen as evidence of their acquisition over time of the concepts they are able to draw on independently; however, at a further level, it might be said that they could be securing an understanding of the concept of 'concepts' per se, that is the role they play in organising their thinking in other disciplinary contexts.

L's use of the Critical Thinking approaches of close reading and reciprocal teaching which she had adopted to address the specific issues of students' comprehension of complex philosophical texts includes her overtly sharing with her students how to assess the quality of their understanding . As such, she sets out in very 'natural' language the criteria for what 'secure' understanding would look like, that is something that can be explained clearly and confidently in one's own words, (6:12); and what effective explaining to someone else looks like (see p.142 above). In this way, L is engaging her students in a very explicit process of clarifying what 'understanding' means and how they can assess the quality of their own 'understanding' of a philosophical text.

The Standards in particular seem to be part of the Critical Thinking framework which lend themselves most effectively as a metacognitive tool, and providing a metalanguage with which all three teachers and their students talk about the quality of their thinking and the representation of that thinking in the written forms required by their respective A level specifications. As referred to above, J uses the Standards as a metacognitive tool which are made explicit to students as featured in the prompts used in his lessons (fig 5.2) and as made explicit through his instructions (5.11) whereby they are operationalised for the nature of the A level biology exam questions students were working on. Similarly, M (4.14) draws on the Standards as an explict 'framework for analysis…for what makes good work'. This language features in his guidance to students on the A level webpage he shares with

students (see table 4.2) whereby he makes specific reference to precision, accuracy and depth. However, M not only operationalises the Standards in terms of the requirements of the exam assessment objectives but he engages in a process of further refined contextualisation in his peer critique lesson to relate the Standards specifically to the demands of a particular exam question (4.13;4.15). His use of the Standards as metalanguage is further illustrated in teacher-student interactions, with frequent exhortations by M for students to 'clarify', 'explain', 'what do you mean by…?' , 'in what way?' (4.12; 4.16) which is an articulation of the Standard of clarity as operationalised by the Critical Thinking model (Paul & Elder, 2006), serving to support students in developing their thinking further. Whilst not as fully embedded in her teaching as M, and demonstrating a degree of scepticism regarding Paul's model, L is more categorical about using the Standards as metalanguage, referring to them as 'terminology', '…and I use the terminology on what they're trying to do, so …talking about precision and accuracy, which isn't exclusively Critical Thinking but it is Critical Thinking terms that lots of us use' (6.25) and which the data shows her using explicitly in lessons (6.23; 6.24).

To summarise, Critical Thinking appears to be drawn on to some degree by all teachers as a meta-language with which to talk to students about what they are doing, making explicit the criteria against which the quality of thinking and, subsequently, the written representation of that thinking, can be assessed in the context of respective A level demands. This appears to be achieved through the way teachers operationalise for their students the Intellectual Standards, Fundamental Concepts, close reading and reciprocal teaching. It could be argued that in this way, these teachers, to varying degrees, are engaged with what Halpern (2003) in the theory chapter (ch.2) calls making 'metacognitive monitoring skills … explicit and public so that they can be examined'. Thus, it could be said that by drawing on selective Critical Thinking approaches to make explicit the process of learning as well as the outcomes of learning, it could be argued that Critical Thinking in this context is presented as both visible and invisible pedagogy by bringing to the surface the processes by which students can monitor and assess the quality of their own thinking which they may subsequently 'acquire' overtime as their 'own' way of operating in the discipline. However, as indicated above, these metacognitive strategies drawing on features of the Critical Thinking model were invariably located within socio-constructivist based activities and I suggest it is the combination of these two features which appear to have fostered over time

amongst students of a degree of autonomy and responsibility for their own learning. Whilst recognising the artificiality of treating these two aspects separately, as in the classroom they are intertwined, the role of socio-constructivist approaches in relation to supporting critical thinking outcomes will now be examined.

7.3.2.2 Critical Thinking, Socio-Constructivist Approaches and Critical Thinking Outcomes

The theory chapter included a theoretical link between Critical Thinking and socio-constructivist approaches as it was deemed to be through the transfer of interpretation to students, with the teacher acting as facilitator, that students have the time and space to examine ideas in depth (Meyer, 1986; Thayer- Bacon, 2000; Li Li, 2011). In this way, Critical Thinking was construed as something not explicitly taught but fostered through discursive practices within the classroom. Indeed, all three teachers in this study have established practices within their classrooms that generate opportunities for a lot of student talk. In other words, from a socio-constructivist point of view, students have the time and space with which to explore for themselves and grapple with lesson content or, what has been described from a Critical Thinking perspective as 'the opportunity to digest new information, concepts, and methodologies presented to them' (Meyer, 1986, p.63) and to convert 'inert knowledge' into 'activated knowledge' (Paul & Elder, 2006) as explored in chapter two. This appears to be accomplished through a shared feature across all case studies of establishing an 'ebb and flow' approach, with specific short teacher inputs setting up tasks which invariably allow students time and space to discuss responses to tasks set. As a result, teachers were free to circulate and interact with individual or small groups of students as appropriate, as illustrated in the data (figures 5.3-7; fig 4.2). Such tasks entailed a weakening of teacher control in some contexts. For example, J allows students the choice of which topic to work on, depending on their assessment of previous performance on exam questions (see J's lesson contexts, p.100 above) J also gave students a degree of choice in how they work and organise their testing (5.9). In this extract there was a mixture of strong and weak teacher control, with J giving guidance on the pacing, 'you should be getting to the point where you're ready to start testing…' with a reminder of the standards of accuracy, depth and breadth in relation to their answers, but with a degree of freedom over how they do that, 'I don't mind how you do it, I want you to distil that section into the key things you have to bring into the exam…' (5.9).

As a consequence of the tasks set across all case studies, whereby students are 'released' to work in pairs/small groups, the resulting teacher/student interactions consist of what Li Li (2011) describes as a series of complex and micro-related contexts. It is at these junctures where the teacher probes student understanding, where misunderstanding is surfaced and addressed, and as such they constitute the very locale in which Critical Thinking can be said to occur (Li Li 2011). From a Bernsteinian perspective, this facilitative approach constitutes a weakening in teacher control across all three case studies with the teacher *within tasks* responding to student questioning and supporting students in developing or constructing their own understanding of complex content. That such interactions are established practices in the classes in this study is particularly illustrated by the frequency of the IRF/I structure examined in the data chapters (chs. 4-6). In these instances the teachers' feedback serves to take discussion further forward by placing responsibility on the students to develop their thinking. In other words, it does not close down the exchange but provides further initiation which keeps it moving forwards for greater depth or precision (4.16; 4.18) or to surface and then address precise gaps in knowledge or understanding (5.16; 6.14). In effect, in these instances, teachers' interactions and responses are being formulated in direct response to students' contributions. In other words, teachers are themselves part of a chain of exchanges with students in which the direction, to some degree, is framed by the student, either in terms of developing their thinking further or in response to a specific misconceptions.

In effect, such interactions represent a form of 'slowing down' the thinking, unpicking the elements of answers and probing for precision. As such, teachers, through this process appear to be supporting students in a very explicit and personalised way in the construction of very discrete or precise steps in understanding or knowledge. Consequently, students appear to be guided towards a mastery of what had been, on the part of the student, a vague or impressionistic understanding. In other words, the 'mystery' of the subject or topic is unmasked for them, it becomes something which they start to 'acquire' for themselves, as shown by J's scaffolding students understanding of the process of an action potential (5:16) or L's interaction to support students' understanding of a deductive argument (6.15). Furthermore, across all three case studies, there is evidence of students initiating and taking a lead in their learning with the teacher (4.19) with, in some cases, the role of teacher questioner/student answering being reversed as shown in J's lesson with a student using J

as a resource to check his own understanding, and then questioning the teacher's response against what he has understood from the textbook (5.18); or in L's lesson with a student taking L through a Socratic questioning sequence to secure her own understanding of Kant's moral argument (6.20). From a Critical Thinking perspective, this could be interpreted as evidence of students engaging critically with their own understanding of content. It could also be said to reveal something of students' attitudes or dispositions towards learning which will be examined in section three below.

However, in two of the case studies, strong teacher control of instructional discourse arise somewhat incongruously in the midst of what were more facilitative dialogic exchanges between teacher and student. Such teacher responses serve to illustrate the institutional constraints at play in any classroom and the rather tenuous balance at times between strong and weak teacher control. As was shown in chapter four and six, both M and L were seen to curtail what could be described as 'authentic' criticality when for example, when a student raised question about the apparent inconsistency within the story of Genesis, which the teacher deemed not to be appropriate for the sequence in the lesson (6.22); and where students wanted to pursue a point about fracking arising from their independent reading on American political issues, but were curtailed, and brought back to the topic at hand on Fiscal Conservatives (4.21). Such instances suggest that fostering student criticality and independent thought, however desirable, is still subject to the constraints imposed by the exigencies of preparing for the A level exam. This, in turn, may raise the question as to whether Critical Thinking can ever be used in its entirety in the classroom. Indeed, the case studies have shown Critical Thinking to be drawn on selectively by these teachers and used as a servant of other imperatives dictated by the wider field, in terms of the curriculum and exam specifications, rather than as a pedagogic aim in itself.

However, to summarise, notwithstanding the constraints of an externally imposed high stakes examination system, it appears as if pedagogical practices featured here align with the idea explored in the theory chapter (ch.2) that learning to think critically appears to be an inherent social process embodied in discussion and student led activities (Len Dam & Volman, 2004) in which the teacher takes on the role of facilitator, rather than instructor. In other words, learning to think critically is invisibly fostered in the context of the discipline through such practices, rather than explicitly or visibly 'taught'.

To conclude this section, this study has attempted to illuminate and explore the relationship between Critical Thinking as outcome and process given that the literature identified the lack of focus on process as a deficit within the field (see ch.1). The data presented in the case studies serves to illustrate a very clear relationship between teachers' construction of Critical Thinking pedagogic processes to support critical thinking outcomes, as embodied in the CT/ct construct operationalised by the practice featured in this thesis.

Nevertheless, by drawing on Bernstein's concepts of visible and invisible pedagogies, the relationship between Critical Thinking processes and critical thinking outcomes as featured in the classroom practice in this study is a complex one comprising paradoxically both visible and invisible pedagogies. The former is illustrated by strong evaluation criteria in terms of critical thinking outcomes as laid down by the A level specifications with a heavy focus on the production of the pedagogic texts such specifications demand. Yet, a closer examination of those critical thinking outcomes suggest they cannot, by definition, be 'delivered' visibly, but are skills that need to be fostered 'invisibly' over time. As has been shown in this section, the means by which teachers attempt to enable students to achieve such outcomes draws on specific features of the Paul's Critical Thinking model but which are rooted in practices that draw on socio-constructivist and metacognitive approaches to teaching. However, before concluding this chapter, there is a further feature arising from the practice presented in this thesis that I argue appears to be being fostered 'invisibly' amongst students by their teachers' Critical Thinking pedagogic practices that may be examined in the light of what the literature identified as 'Intellectual Virtues' or 'Critical Spirit'.

7.3.2.4 Critical Thinking 'Virtues' Supporting Critical Thinking Outcomes

In this final section, I examine the role of the Intellectual Traits or Virtues identified in chapter two and suggest that these normalised ideals as portrayed by Critical Thinking theorists are fostered in more modest forms by the teachers' pedagogic actions in the classes featured here . I also suggest that they also contribute dispositionally to students' ability to meet the critical thinking outcomes required by their respective A levels.

In my examination of the normative conceptualisation of Critical Thinking, in chapter two, I highlighted the fact that evaluative competence, although necessary, was not deemed to be sufficient to constitute Critical Thinking, and that there should be a will or desire to engage in such thinking (Siegel, 1988; Lipman, 2003; Winch, 2006). In other words, the role of

Intellectual Traits (Paul & Elder, 2006) linked to the classical 'virtues' play a part of what is deemed to be Critical Thinking, or more precisely, what it is to be a Critical Think***er.***

I would argue that the data does reveal episodes in which students demonstrate what I have termed in the data chapters as critical qualities, that is particular adaptive attitudes to learning which could be said to be how such 'virtues' or 'traits' might be manifested in a classroom context. As such, I would suggest that through the pedagogical practices explored in this chapter that teachers have developed and embedded over time, they appear to be inculcating invisibly in their students adaptive attitudes to their learning which would indicate a degree of self-reliance and responsibility in the context of their learning in the A level classroom. For example, as seen, in M's classes (ch.4), it appears that a combination of the teachers use of 'concepts' as a pedagogical tool within the discursive culture he has engendered, seems to have promoted a confidence and willingness amongst his students to lead or sustain discussion (4.12; 4.19). In other words, the blending of his use of the concepts with a discursive culture provides students with the means to function discursively in the subject with a degree of independence (4.9; 4.10; 4.12) which underpins their ability to address the more complex synoptic questions required for the higher level performance in the A level exam.

Examples from other teachers also illustrate the development of critical qualities through pedagogical practices deployed in their classrooms. So, J's explicit focus and operationalisation of the Intellectual Standards, blended with his interpretation of Blooms in the context of the demands of A level biology combined with the explicitly dialogic culture he has created, appears to have fostered a metacognitive style of thinking brought to bear on students' evaluation of their own thinking. As a result, he appears to have established a 'way of learning' that characterises what it is to be a students of biology in his classroom. This was illustrated in the data where students were adept at assessing the quality of their own understanding (5.19; 5.20) confirmed by J's own experience of students' assessment of their understanding (5.21). However, that such student responses entail something further in the form of critical qualities could be said to be illustrated by the confidence and ability to question the teacher on texts which did not make sense to them. Examples of such behaviour include the episode where a student questioned J and also the textbook in order to secure his own understanding (5.18) or where L's student engaged with her in a series of Socratic questions on Kant's moral argument (6.20); and also the student questioning

perceived inconsistency in the Genesis story as it was being presented (6.22). That the former was encouraged and the second closed down by the teacher, was examined above, and is indicative of the constraints at play in the classroom.

To summarise, given that data appears to reveals episodes which indicate students' critical engagement with content; a critical metacognitive reflection on assessing their own understanding; and a willingness to ask questions of each other, of the teacher, and of the textbook, to secure their understanding, I would argue that teachers appear to have created a culture invisibly over time where students do not seem to be willing to live with ambiguity, where a lack of understanding is not something which happens because they are not 'clever' but is something that they can address through their own pursuit of questioning and interrogation of information, the teacher, or the textbook. Therefore 'not understanding' is something they have been encouraged to recognise and then address. As such, their interactions with teachers serve to reveal a lack of understanding *so that* these can be addressed. In other words, I would suggest that these students appear to be developing tacitly particular dispositions or attitudes towards their learning as outlined above which could be described as aspects of the dispositional features of criticality or 'critical qualities'.

To conclude my answer to research question three, Bernstein's heuristic of visible and invisible pedagogies has served to highlight the complex, even paradoxical, relationship between teachers' use of Critical Thinking pedagogical processes and critical thinking outcomes as embodied by the high stakes A level exam. At one level, the practice featured in this study aligns with features of visible pedagogy in the context of strongly classified A level specifications which constitute for students, teachers and the school high stakes assessments. However, the very nature of the outcomes required for success in those exams are such that they cannot be met within the confines of a strictly visible pedagogy, but require critical skills and dispositions that can only be fostered invisibly. It is in this context that meta-cognitive pedagogical practices were examined, whereby teachers, by drawing on selective features of the Critical Thinking model as a form of meta-language provided a bridge to enable students to access and make their own, over time, the processes through which the critical thinking outcomes of the A level could be achieved; and such approaches were housed within a socio-constructivist model of learning which provided the intellectual time and space to rehearse, trial and test out such skills and understanding. As a result, I would suggest that findings from this study have served to reinforce a key idea from the

theory chapter that, in essence, Critical Thinking, as both a skill and a disposition, is nurtured through social practices in the classroom.

7.4 Conclusion to the Chapter

It is possible to conclude that Critical Thinking in the hands of these teachers is a highly flexible concept. As has been shown, the teachers bring to their understanding of the Critical Thinking model their own perspectives which, in accordance with Eraut's constructivist perspective on teacher professionalism, results in three different manifestations of Critical Thinking in practice. M could be said to be the teacher who has infused the Critical Thinking model most systematically into his practice, whereas J and L draw clearly on specific aspects of the Critical Thinking model as they perceive relevant to the needs of their students which is seen as an additional resource, rather than as central to their teaching. Indeed, L is ambivalent as to whether the Critical Thinking model is itself 'Critical Thinking', making her view of it as a set of pedagogical tools and terminology, as distinct from Critical Thinking as embedded in her subject.

In all cases, none of these teachers claim to be teaching Critical Thinking explicitly and visibly as an independent body of knowledge. Indeed, it could be suggested that the teachers, in the end, in some sense are disinterested in if what they think or do and say to students are faithful to the letter of Paul's Critical Thinking model (or Blooms or the A level specifications). These frameworks serve as resources that are interpreted flexibly, not understood as containing fixed definitions. It is in this context that teachers exert a sense of agency (Cochrane- Smith & Lytle, 2009) or professional independence (Leung, 2013) as manifested in the complex and interrelated processes of interpretation and translation into practice they undertake in terms of Critical Thinking; the outcomes required by their respective subject's A level specifications; and their assessment of the difficulties this presents students. As a result, Critical Thinking contributes to, but is not the totality, of their pedagogic content knowledge (Shulman, 1986).

However, such agency is not untrammelled; it is understood in the context of the school and the pressures of an externally fixed curriculum and a system of high accountability. Teachers' primary focus, therefore, is on enabling their students to learn and produce something that will lead to success in the exam. However, although this is their primary

focus, and therefore aligns with what is understood as an illustration of Bernstein's visible pedagogy within the context of strong subject classification and with a focus on performance, the nature of such performance as embodied in the A level is such that, paradoxically, it also requires the development of skills and dispositions that can only be fostered tacitly rather than transmitted or delivered explicitly. As a result, as has been illustrated, Critical Thinking has an inherent tendency towards invisibility manifested by those moments featured in the data chapters and explored above in this chapter where, after teachers have made use of the Critical Thinking based tools and structures, they 'release' their students to think things through for themselves.

Finally, the narrative of teacher knowledge and practice presented in this thesis therefore reveals teachers actively engaging with ideas and in doing so they render the frameworks featured here, notably Critical Thinking, in a hybridised form so that it may not be easily recognised, but in a form that makes sense to the teacher in his or her context. In other words, it would appear that once immersed in the field of practice, the theory underlying such ideas are not of primary significance. What matters is how the teachers have taken up the representation of these ideas and as such teachers across different subject areas featured in the case studies have been seen to select, interpret and combine ideas in such a way that they fashion and enact their own coherent and situationally relevant pedagogic practice.

Chapter 8 Conclusion

The purpose of this research was to investigate three teachers' interpretation of Paul's theoretical model of Critical Thinking and how they translated it into their A level teaching. As a result, this thesis is also positioned, at a meta-level, within the wider field of 'the Scholarship of Teaching' (Shulman, 2004), given that, from its very inception, it has been focussed on a close examination of teachers' classroom practice in an attempt to trace and make public the processes at play when grand pedagogical concepts, in this case 'Critical Thinking', come to the classroom.

As was explained in the Introduction, the origins of this research emerged from a specific and localised practice- based issue of developing an approach to teaching that would support sixth form students from a London comprehensive secondary school in meeting the demands of the highest grades at A level. It was in this context that the school supported teachers in engaging with a Critical Thinking professional development programme based on Paul's trans-disciplinary model of Critical Thinking, in an attempt to address the issue; and it was three teachers' resulting interpretation of Critical Thinking and their enactment of it in their classrooms that ultimately became the subject of this research. As such, this thesis has attempted to respond to the call from the field of Critical Thinking itself for much needed research into the transfer of theoretical models of Critical Thinking into a practical pedagogy (Tsui, 2002; Flores et al, 2010; Moore, 2011b).

I have, therefore, presented a practice-based exploration of Critical Thinking based on Richard Paul's trans-disciplinary model of Critical Thinking through the detailed case studies of three teachers from different disciplines, all of whom, prior to the research, had engaged with the school based professional development programme based on the above Critical Thinking model and had self-identified as applying it in their A level teaching. In this final chapter I synthesise and clarify key findings arising from the thesis as well as consider the wider implications. The chapter is organised as follows: firstly, I revisit the original purpose and theoretical context of the research and in so doing I draw on the key points arising from the theory chapter (ch.2) and methodology chapter (ch.3), highlighting significant ideas in relation to the literature of Critical Thinking and pedagogy, and implications for my methodological choices; secondly, I summarise and refine the key findings from the data chapters (chs.4-6) which were examined more fully in the discussion chapter (ch.7) in

response to my research questions. Finally, I examine some of the implications of this research in terms of its relevance beyond its local context; the transfer of these findings in the context of reformed A level qualifications; and possible further research.

8.1 Revisiting the Purpose and Theoretical Context of the Research

I opened the thesis by examining some of the theoretical issues from the Critical Thinking literature and the questions raised in terms of its implications for pedagogy, most notably the failure of Critical Thinking to take root in the classroom, or what has been described as Critical Thinking's 'unresolved problem of pedagogy', (Bereiter, 2002, quoted in Dean and Kuhn, 2004, p.269). The primary purpose of this thesis, therefore, was to examine from close quarters what actually happened pedagogically when teachers brought Critical Thinking into their classroom practice. However, in doing so, it served an additional meta-purpose of constituting an account of research into professional practice in keeping with the principles of the scholarship of teaching and learning by being 'learning-focussed, domain specific, and oriented towards analysing educational experiences and outcomes …' (Shulman, 2004, p.161) which, through this thesis is made public, open to review and critique.

Amongst the multifarious models and definitions of Critical Thinking presented by the literature, I selected and examined specific conceptualisations of Critical Thinking relevant to the pedagogical focus of this study, namely: Critical Thinking as argument; a normative view of Critical Thinking comprising wider reasoning skills, standards, and dispositions; and a disciplinary specific view of Critical Thinking. However, the key issue raised in the theory chapter (ch.2) was the difficulty of transferring such theoretical conceptualisations of Critical Thinking into pedagogical practice in the classroom. It was in this context that I introduced a further model: Paul's trans-disciplinary model as potentially offering a means by which the pedagogical impasse presented by the previous models might be addressed. Emerging from this exploration was a key distinction between critical thinking as outcomes (ct), in other words, what students are expected to be able to do and produce in terms of critical thinking, and Critical Thinking as pedagogical process (CT), that is what teachers do pedagogically in their classrooms to enable students to produce such outcomes. This distinction was further illustrated by the apparent links made in the Critical Thinking literature between Critical

Thinking and other pedagogical conventions such as Bloom's taxonomy; and socio-constructivist and metacognitive approaches to pedagogy. As a result, this research was an attempt to explore how Critical Thinking's 'unresolved problem of pedagogy' might, in the context of three classrooms, be 'resolved'.

Given that the primary purpose of this thesis was to examine teachers' use of Critical Thinking in terms of their pedagogical practice, the second part of theory chapter (ch.2) positioned these issues within the wider field of teacher professional practice, examining the influences which may encourage or hinder the transfer of a pedagogical model, in this case a Critical Thinking model, from theory to practice. Indeed the very notion of a direct 'transfer' was challenged with reference to Eraut and Shulman, amongst others (Elliott, 1993; Cochran-Smith & Lytle, 2009; Ball et al, 2012; Leung, 2013), by examining the more complex symbiotic relationship between theory and practice. Based on a constructivist conceptualisation of teacher professionalism, such a relationship appeared to be subject to influences emanating from the individual teacher context; the role of the institution; and the wider education system as determined by national policy. It was in this context that I drew on the heuristic offered by Ball et al (2012) of 'interpretation' and 'translation' to analyse teachers' understanding and enactment of Critical Thinking in the context of their A level teaching.

An examination of the literature therefore revealed several layers of theoretical complexity underlying the focus of this research into teachers' understanding of Critical Thinking, and how that understanding translates into classroom practice. These included: the complexity of the relationship between the different array of theoretical conceptualisations of Critical Thinking and pedagogical practice; the distinction between Critical Thinking as a process and critical thinking as outcomes; that pedagogical practice itself is subject to a range of wider influences; and that the introduction of a 'new' pedagogical model has to be negotiated within the context of those influences.

It was apparent, therefore, that investigation into classroom practice of Critical Thinking was to yield highly complex and multi-dimensional dynamics at play. As a result, I drew on Bernstein's concepts of visible and invisible pedagogies as a heuristic with which to examine, in Bernstein's terms, what was happening at the 'micro' level of the classroom in terms of teachers' interpretation of Critical Thinking and their translation of it into practice. However, as was discussed in chapter seven, this heuristic appeared to uncover a paradox

in terms of accounting for the complexity of what was happening pedagogically in relation to Critical Thinking processes, critical thinking outcomes, and disciplinary demands, which appeared to align with both visible and invisible pedagogies.

Given the purpose of the study was to examine close at hand teachers' interpretation of Critical Thinking and their translation of that interpretation into their classroom practice, this informed my choice of methodology and research design which I elaborated upon in chapter three. My approach consisted of a combination of three methodological traditions which lent themselves to the close examination of practice in the context of the classroom: ethnographic perspective, case study, and micro-ethnography. I then applied this design to individual case studies of three participant teachers (chapters 4-6). I will now review of the key ideas from my summaries of chapters four, five and six, which constituted the data analyses, and the subsequent discussion (ch.7) of the three participant teachers' practice.

8.2 Key Findings

In this summary I will use sub-headings to echo, refine and reflect on the significant issues yielded by my response to my three research questions in chapter seven. The sub-headings are made up of: Critical Thinking as individual understanding; Critical Thinking as disciplinary pedagogy; and Critical Thinking as an enabling tool. These headings themselves are indicative of an overarching finding from this study that there is no single universal entity known as 'Critical Thinking' but, rather, it appears to be a malleable concept which assumes a significance only in the context of its use.

8.2.1 Critical Thinking as Individual Understanding

Whereas the literature had identified what it presented as teachers' lack of clarity over what Critical Thinking was as an issue regarding its implementation in the classroom, all three teachers in this study were able to give their own clear articulation of what they understood by 'Critical Thinking', as shown in the data chapters (chs. 4-6). However, as detailed in the discussion chapter (ch.7), that these conceptualisations were not identical, even though they had all undergone the same Critical Thinking training programme, indicates a process of contextualisation taking place. In other words, these teachers appear to have engaged with the concept of Critical Thinking presented in Paul's model in situationally relevant ways and as such, for each teacher, his/her own conceptualisation constitutes an individual

representation of Critical Thinking. Indeed, in the data chapters (chs.4-6) and the discussion chapter (ch.7) I argued that teachers' conceptualisation of Critical Thinking in this study is linked closely to their classroom based practice, as opposed to abstract, theoretical constructs; and that such practice-based conceptualisations appeared to be inherently linked to the epistemic demands of their subject as presented in the form of their A level specifications, rather than as a pedagogic aim in its own right, divorced from their discipline. As a result, three different disciplines engendered three different conceptualisations: Teacher M (ch.4) interpreted Critical Thinking in politics as being an ability to relate different forms of evidence from case studies to key political concepts in order to produce the evaluative synoptic arguments required by the A level, thus constructing his definition of Critical Thinking in terms of the subject and the exam; L perceived Critical Thinking (ch. 6) in terms of engaging with conceptual philosophical content and the development of philosophical argument in the context of her philosophy and ethics course; and J positioned his two metacognitive conceptualisations of Critical Thinking clearly in the context of the demands of the A level biology exam (ch.5). In other words, it could be said that these teachers appeared to be engaged in a process outlined in chapter two by Moon (2008) of developing their own local definitions of Critical Thinking which applied to the local situations between themselves as A level teachers and their students.

Furthermore, I also indicated in chapter seven how teachers not only brought their disciplinary contexts to their conceptualisations of Critical Thinking, but additionally, their own personal propositional knowledge (Eraut, 1994) or personal theories (O' Hanlon, 1993) also imbued their interpretations of Critical Thinking. As a result, J had drawn on his understanding of Bloom's taxonomy as part of his metacognitive conceptualisation of Critical Thinking (ch.4); this differed to M who conceived Critical Thinking as 'thinking politically'; these contrasted with, L's personal critique of Paul's Critical Thinking model as a way of teaching rather than 'Critical Thinking' per se, which she saw as embedded in the very epistemology of her subject (ch.6).

To conclude, Critical Thinking as presented in this study, is clearly not a single entity, but encompasses three individual and situationally appropriate conceptualisations. To reach these individual representations, each teacher had engaged in an intellectual and critical process of their own, blending of their interpretation of the Critical Thinking model with their A level specifications, and with other personal propositional knowledge or personal theories

they brought to their professional context. Given the differences in conceptualisations, it would not be surprising to see that these manifested themselves in different forms of pedagogic practice in the classroom. This will now be reviewed in the context of Critical Thinking as disciplinary pedagogy.

8.2.2 Critical Thinking as Disciplinary Pedagogy

In the data chapters (chs.4-6) and the discussion chapter (ch.7) I drew on the CT/ct construct operationalised in this study to differentiate between critical thinking outcomes (ct) as determined by the A level specifications, and the Critical Thinking pedagogical processes (CT) teachers deployed to support their students in achieving those outcomes. As such, the CT/ct construct appears to embody two key features of relevance to Critical Thinking as presented in this study: firstly, critical thinking outcomes as having an inherent disciplinary character; and secondly, Critical Thinking positioning itself at the interface between ontology and epistemology. These will now be elaborated upon further.

As discussed in chapter seven, the requirements of the A level exam set out in the subject specifications were highly visible in all three classrooms in terms of the language used by teachers and students; shared understanding of the protocols for exam questions and answers; and the use of exam papers, mark schemes, and exam board endorsed textbooks. All teachers were able to articulate in precise terms the specific challenges their students faced in relation to the critical thinking outcomes required by their subject's A level exam which derived from the epistemological features of the discipline: whether this be developing the skill of analysis and evaluation to develop answers to synoptic questions of political issues (ch.4); securing deep and authentic mastery of complex scientific content (ch.5); or understanding conceptually abstract philosophical arguments (ch.6). It was in this context that I drew parallels with Shulman's concept of pedagogic content knowledge, as explored in chapter two and discussed in chapter seven, whereby teachers demonstrated an understanding of precise epistemological difficulties and associated misconceptions posed by the subject. This analysis informed teachers' selection of aspects of the Critical Thinking model to develop appropriate ways of teaching over time, which supported students in mastering disciplinary specific content and skills. Examples from the data included: M's adaptation of the Critical Thinking tool of 'Fundamental Concepts' to support students' ability to manage a vast body of knowledge and to help structure analytical thinking (ch.4); J's

highly indexicalised forms of the Intellectual Standards combined with his interpretation of Bloom's taxonomy to assist students in developing and evaluating the quality of their answers in relation to specific A level biology exam questions (ch.5); and L's choice of the pedagogical tools of reciprocal teaching and close reading, rationalised in the context of the specific difficulties she had identified her students experiencing in relation to understanding complex philosophical arguments (ch.6).

It is in this context that I argue the Critical Thinking model is positioned at the interface between ontology and epistemology and its claims for its trans-disciplinary properties may be supported. The examples referred to above, and examined more fully in the discussion chapter (ch.7), illustrate teachers engaging ontologically with Paul's Critical Thinking model through their use of its terms and associated definitions intended to describe Critical Thinking that they then interpret in the context of their own A level specifications. This, in turn, appears to determine their pedagogic actions to enable their students to address the epistemological demands posed by the respective A level. However, because the nature of these difficulties differed across disciplines, and across different cohorts of students, the same theoretical stimulus or input in terms of the Critical Thinking model resulted in different knowledge and practices (Eraut, 2008; Elliott, 1993).

It should be added, however, that the significant element in this process is not the A level nor the Critical Thinking model, but the agency of the teacher who had engaged in an intellectual process of interpreting and translating at several levels: A level specifications; Critical Thinking model; and pedagogic actions, and whose primary concern was enabling students to produce the outcomes as determined by the A level exam. It is through their individual mediation of these three domains that the teachers featured in this study could be said to have engaged in 'minor acts of knowledge creation of their own' (Eraut, 1994, p.47) as illustrated by the pedagogic practices referred to above and examined more fully in the data and discussion chapters (chs.4-7)..

However, whilst the relationship between disciplinary defined critical thinking outcomes and a Critical Thinking based pedagogy to support such outcomes was a clear thread running through this thesis, the pedagogic practices featured here comprised a further dimension to this relationship: this consisted of pedagogic approaches which appeared to foster tacitly or invisibly amongst students critical qualities that might be deemed as pre-requisites for such

critical thinking outcomes. I examine this final feature under the heading of Critical Thinking as an enabling tool.

8.2.3 Critical Thinking as an Enabling Tool

In the chapter seven, I drew on Bernstein's concepts of classification and visible/invisible pedagogies as a heuristic with which to explore the complexity of the Critical Thinking pedagogical process/critical thinking outcomes construct and it was here where I uncovered an inherent paradox in the teaching for critical thinking in any disciplinary context. Whereas the A level critical thinking outcomes are features of strong disciplinary classification and were highly visible in all the classes included in this study, the nature of those outcomes implicate a degree of independence of thought and autonomy, where, for example, developing the skill of analysis and evaluation to develop answers to synoptic questions (ch.3); securing deep and authentic mastery of complex scientific content or critical evaluation of data (ch.4); or understanding conceptually abstract philosophical arguments (ch.5) could not be didactically taught or 'given', but needed to be inculcated as skills and critical qualities, invisibly, over time. In other words, students needed a pedagogy that enabled them to develop such skills and as such, it seems that the process through which highly visible critical thinking outcomes are acquired is inherently an invisible one.

The tendency towards invisibility when Critical Thinking pedagogy met with the visibility of the A level syllabus was manifested in the moments in the data where teachers drew on a range of Critical Thinking practices associated with socio-constructivist approaches, and also by using aspects of the Critical Thinking model as a form of meta-language to provide students with specific structures or supports with which to talk explicitly about their thinking and learning in the context of their subject. Indeed, the apparent link between Critical Thinking and socio-constructivist approaches and metacognition, outlined in the theory chapter, appeared to be reinforced by the findings of this study. This will now be elaborated upon further.

As was examined in detail in chapters four to seven, teachers drew on aspects of Critical Thinking as a meta-language through which they made explicit to students the procedural means by which they may develop the higher order skill or outcome required by the A level exam. In other words, teachers, to some degree, used the features and terminology of the Critical Thinking model as a meta-language with which to talk about the processes students

were undertaking, making explicit the criteria against which the processes and the quality of thinking and, subsequently, the written representation of that thinking, could be assessed. These were illustrated, for example, by M's explicit use of fundamental concepts to support students marshalling of vast content to construct the more demanding evaluative synoptic arguments required for the top grades in politics (ch.4), or by J's indexicalised use of the 'Intellectual Standards' (ch.5) or a L's meta-commentary on checking what was meant by 'understanding' in the reciprocal teaching task (ch.6). Critical Thinking as a meta-language was a common feature seen in all three teachers' practice as a means of providing students with tailored structures and tools to meet specific disciplinary demands of the A level. Critical Thinking as a form of metalanguage was also blended within socio-constructivist approaches. All three teachers orchestrated discursive practices infused with the supports or structures drawn from the Critical Thinking model, referred to above, which generated opportunities for student talk and individual and small group interactions between student and teacher, allowing students the time and intellectual space with which to process and grapple with complex lesson content. I presented examples of where, in these discursive contexts, students demonstrated a degree of autonomy over their learning, initiating and taking the lead in their learning, and questioning the teacher as part of a critical process of evaluating their own understanding (chs. 5 & 6); constructing their own arguments (chs. 4 & 6); and developing answers of greater sophistication (chs.4&5) as required by respective A level specifications. Indeed, I tentatively suggested that the pedagogical approaches adopted by teachers outlined here served to foster invisibly to some degree 'critical qualities' or a dispositional premium required not only for students to engage with difficult content and develop higher level skills of analysis and evaluation for the exam, but which, potentially, could serve them as learners and thinkers beyond A level.

However, this enabling function of the Critical Thinking pedagogy presented here was also subject to some constraint. As examined in chapters four and six, and detailed more fully in the discussion chapter (ch.7) there were occasions where teachers were seen to curtail what could be described as 'authentic' criticality when student questioning was not aligned with the purpose of the lesson at hand: for example, when a students wished to question the Genesis story in a philosophy and ethics lesson (ch.6) and when two students wanted to pursue the implications of fracking for US and Middle East relations in a politics lesson (ch.4). Such instances suggested that fostering student criticality and independent thought,

however desirable, is still subject to the constraints imposed by the exigencies of preparing for the A level exam. This, in turn, may raise the question as to whether Critical Thinking can ever be used in its entirety in the classroom or will always be subservient to the requirements of whichever syllabus is in operation.

A review of these three features of Critical Thinking as presented in this study points to a conclusion that Critical Thinking in pedagogical terms is a highly complex phenomenon. In the hands of these three teachers, Critical Thinking has shown itself to be a malleable concept shaped by and infused with each teacher's interpretation of the epistemic challenges their respective subjects present their students combined with other professional knowledge or theories that they bring. As a result, three different manifestations of Critical Thinking in the classroom have been presented, each of which makes sense to the teacher in his or her context. Critical Thinking in this study, therefore, is not something to be taught, indeed, it cannot be defined in terms of what is to be taught and learned; rather it presents itself as a set of principles for thinking and teaching that teachers have interpreted and applied to their own individual disciplinary contexts. Indeed it is through the very process of teachers translating their interpretation of Critical Thinking into the context of their practice that it assumes significance and meaning.

Each teacher, therefore, has been engaged in a critical intellectual process of 'independent decision making' (Leung, 2013) of his/her own, contributing to a local conceptualisation and manifestation of Critical Thinking. The question arises, therefore, of the wider implications of this research, which is a narrative of three specific teachers' enactment of Critical Thinking, clearly localised within one particular school. This will be addressed in the following section.

8.3 Implications of the Research

In this section I examine the implications of this research from three perspectives: firstly, in terms of the contribution to be made by a localised study to wider theoretical and policy contexts; secondly, the implications of this study in the context of recent A level reform; and finally, suggestions for further research.

8.3.1 Wider Implications of a Local Study

As outlined in the Introduction, this study constitutes research into a particular local context,

that is the use of a Critical Thinking model to address issues of achievement amongst a particular cohort of students in specific classrooms, and therefore the outcomes of this thesis could be said to be restricted as an account of local knowledge. However, as referred to in the methodology chapter (ch.3), such knowledge can often function as public knowledge by informing practice and policy beyond the immediate context and although all practice is local at heart, such local knowledge is interactive with larger, global influences and is often useful publicly beyond the local context (Cochrane- Smith & Lytle, 2009).

In relation to this study, the literature clearly identified a widespread issue across a range of educational contexts of the desirability of Critical Thinking as an educational outcome but of the apparent failure of Critical Thinking to transfer to classroom practice, attributing this to a range of factors examined in the Introduction and which informed my research questions. It is in this context of a dissonance between the educational desirability of Critical Thinking and its apparent absence in schools that there has been call from the field of Critical Thinking for research into Critical Thinking in classroom environments. By definition, research into any classroom practice will be 'local' and as such my research presents three cases, or three 'locales', examining at close quarter Critical Thinking in practice in the context of these three classes. In my discussion chapter (ch.7) I examined in detail how the issues identified in the literature played out in the context of these specific classrooms, which I have summarised above in this chapter under my three sub headings. As a result, this research provides a local response to what has been identified as an issue across a range of educational jurisdictions. As such, it could be said to illustrate the idea that the relationship between local practice and wider theoretical constructs is not necessarily one of mutual exclusivity, but rather one of dialogue, 'recognizing that local knowledge generated by practitioner inquiry in communities is often constructed in response to national, international and global demands that originate elsewhere and that local knowledge is often imbued with ideas, practices and technologies created in other contexts' (Cochran-Smith & Lytle, 2009 p.132).

Indeed, such a dynamic can be seen at work in the context of this research where the Critical Thinking model drawn on in this study originates from the 'Critical Thinking Movement', which had particular momentum in the United States in the late 1980s and 1990s (Lipman, 2003), to address a specific institutional issue of fostering higher level outcomes for students at A level in a particular school in West London, and translated into practice in three particular classrooms, which constitute the case studies presented in this

thesis. As a result, this thesis presents a clear trajectory from the global and theoretical to the specific case and practice. However, the contribution these case studies make, in return, to the field of Critical Thinking in particular, and of wider policy in general, results from a process of analytic generalisation as outlined in the methodology chapter (ch.3) and will now be elaborated upon.

The main thrust of this thesis has been to position the practice presented in this study within a constructivist paradigm, illustrating how teachers actively engaged with ideas and in so doing they rendered the theoretical frameworks presented here, notably Critical Thinking, in a hybridised form so that it may not be easily recognised as the original model, but refashioned into a form that made sense to the teacher in his or her context. Indeed, these teachers have demonstrated a high degree of personal and professional agency in the way they have engaged with frameworks featured in this study (whether the Critical Thinking model, A level specifications or others, such as Bloom's Taxonomy) which have been informed by their student cohort, institutional, disciplinary, and own personal professional contexts. In other words, the theory underlying such ideas was not of primary significance, but what mattered was how teachers drew on such frameworks as resources that were interpreted flexibly in their own pedagogic and disciplinary contexts. In so doing, all three teachers were engaged in their own minor acts of knowledge creation and creating their own localised accounts and representations of Critical Thinking, and thus contributing themselves to theory generation in the field of Critical Thinking. However, although each teacher has interpreted and translated Critical Thinking into their own specific contexts, which, by definition, might not be generalised *beyond* their context, the very fact that teachers engaged in a process of their *own* interpretation and translation in relation to Critical Thinking is itself a finding that could be generalised to contribute to understanding better, and potentially addressing, the gap identified by the Critical Thinking field between theoretical models and pedagogical practice. In other words, whichever conceptualisation or model of Critical Thinking may be presented to teachers, it can never be transferred directly 'purely' into practice, it will always have to undergo a process of mediation by the teacher influenced by the contextual factors that have been examined in detail throughout this thesis.

Such a finding would also have implications more widely for those responsible for generating education policy, especially in relation to pedagogy, who adhere to the idea of a single curriculum intervention or set curriculum programme to be 'delivered'. Findings from studies

such as this would suggest that such 'delivery' is an aberration, and that teachers will always have to engage in an intellectual and critical process of contextualising such 'inputs' for their own professional situations. As a result, the findings from this study serve 'to complicate the technicist images of educational practice that dominate the public landscape and the popular discourse of schools and teaching' (Cochrane-Smith & Lytle, 2009, p.155).

8.3.2 Implications of the Research in the Context of A Level Reform.

As was outlined in the Introduction, the data collection phase of this research took place in 2013. Since that time the English secondary education system has undergone a period of significant reform in terms of GCSE and A level qualifications. At the time of writing, plans are underway to introduce all reformed A level specifications over the course of three years, starting with the first tranche in September 2015, including A level biology; A level philosophy and ethics in September 2016, to be completed with the final tranche, including government and politics in September 2017.

Given a key feature of these teachers' interpretation and enactment of Critical Thinking in their A level classes was linked to the demands of their respective A levels in terms of the critical thinking outcomes they required, and the difficulties these presented their students, it is necessary to review the revised specifications to examine the implications of the reforms in the context of this study's focus of a Critical Thinking based pedagogy. This brief overview would suggest issues identified in the case studies featured here appear to be further reinforced by the increased complexity of content; the greater emphasis on higher order skills and the application of understanding; and increased demands made in terms of academic literacy. As a result, the findings of this thesis of teachers developing their contextualised interpretations and enactment of Critical Thinking to support the demands of A level would retain, or even increase, their relevance in the current context. I will now outline in further detail my reasons for such a claim.

Firstly, 'criticality' although not operationalised in terms of the discipline, still features in the specifications as an explicit aim or objective of the revised courses, where for example, in the politics and government specification, students are expected 'to develop a critical awareness of the changing nature of politics and the relationships between political ideas, institutions and processes.' (Pearson, 2016, p.6) or where, in biology, the claim is made for the course to support students in developing what they define as 'cognitive skills' including

Critical Thinking which the specifications define in traditional Bloomsian higher order thinking terms 'such as analysing, synthesising and reasoning skills' (Pearson, 2015, p. 45). Secondly, the content with which students are expected to engage with critically, however criticality is operationalised, has increased in terms of quantity and also in terms of conceptual complexity. For example, in philosophy and ethics, the highly conceptual content illustrated in chapter six is retained but is supplemented further through the inclusion of a unit on religious language requiring an analysis of religious thinkers' use of negative, analogic or symbolic language, combined with 20th century perspectives from Wittgenstein and Ayer (OCR, 2015a). Similarly in government and politics, students need to supplement their study of the British and US systems with a study of western political philosophy and key thinkers from the 16th century to the late 20th century (Pearson, 2016). A further addition includes source based questions where students are required in two of the three exam papers to make a comparative analysis based on unseen sources. In biology there is also an increased mathematical element requiring greater data interpretation and evaluative skills to be demonstrated in the exam (Pearson, 2015).

Synopticity, although a feature in the previous specifications, has a higher profile across all three revised specifications reviewed here. This assumes even greater significance, and challenge, given these examinations will now be taken at the end of the two year course, rather than in two sessions under the previous bi-partite AS and A2 structure. The implications for teaching so that students are able to retain and manipulate two years' worth of content and are taught to develop the higher level skills from the start of the course may have further relevance and significance for the pedagogical practices featured in this thesis.

Finally, the nature of the exam questions presents further demands in terms of the written genres expected. In all three subjects, assessment takes the form of end of course examinations, with no coursework component. In both politics and philosophy, the examination takes the form of six extended written essays over three papers based mainly on single sentence questions such as ' Critically assess Augustine's teaching on Original Sin' (OCR 2015 b) ' Evaluate the view that UK democracy is in crisis' (Pearson, 2016), with no further structural supports for the essay. As a result, students will be expected to structure much longer, more developed pieces of evaluative writing than was the case under previous specifications.

From this short overview, it is possible to see that the difficulties the three teachers identified for their students based on specific epistemological demands of the previous specifications are likely to be as pertinent in the context of the revised A level specifications. Consequently, an interesting focus of study would be to explore the role of teachers understanding and enactment of Critical Thinking in the context of these revised qualifications, where I would conjecture they would be equally, if not more relevant. As a result, I would argue that the findings from this thesis would transfer well to the new qualification context in which A level teachers now find themselves.

8.3.3 Further Research

As was outlined in the Introduction, this thesis was a response to the demand from the field of Critical Thinking itself for research into classroom experiences that supported students in developing Critical Thinking. As such, further 'local' studies of Critical Thinking in classrooms are needed to expand on this call for practice-based research. In this way a wider and richer tapestry of Critical Thinking in classroom contexts can contribute further to a practice- based theory of Critical Thinking pedagogy, redressing the apparent imbalance between theoretical models and pedagogical practice identified in the Introduction.

However, in the context of this thesis, given the breadth of the concept of Critical Thinking and the inherent complexity of teaching, there were other roads that could have been pursued which were beyond the immediate scope of this study. There are two specific areas which were very close to the surface of this research that would merit further investigation: Critical thinking from the students' perspective; and the link between Critical Thinking and the field of Academic Literacies.

The focus of this research was on teachers' understanding of Critical Thinking and their associated actions in the classroom. Students' work and contributions featured in the data were viewed very much through the lens of their teachers' pedagogic decisions and actions. An area for further research would therefore be examining Critical Thinking from the students' perspective through student interviews and reflections on how they work; observation of student learning behaviours and an analysis of student talk in lessons; and a detailed analysis of the outcomes they produce. Such research would complement the study presented here to add to an understanding of the processes at play when Critical Thinking is brought to the classroom.

A further issue which was very close at hand through my examination of these teachers' enactment of Critical Thinking in the context of their A level teaching was that of the link between Critical Thinking and the field of Academic Literacies. The references to 'pedagogic texts' as the means through which students' critical thinking outcomes were to be assessed both in lessons and also in the final examinations points to the relationship in an educational context of the link between disciplinary based thinking and its communication through disciplinary associated written genres and conventions. Indeed, the role played both theoretically in a disciplinary based view of Critical Thinking and also in the practice featured in this thesis where teachers' conceptualisations and enactment of Critical Thinking was influenced by the disciplinary demands of their A levels has clear parallels with the field of Academic Literacies and the distinction between ideological and autonomous positions (Street, 1984). Indeed, the writing that featured in this study could be said to align with an ideological position, it being embedded in the teaching of the subject as determined by the demands of the A level specifications, and not separate to it (Wingate 2012). Indeed the production, and peer critique of written outcomes, as seen in M and L's lessons, were themselves the locale of Critical Thinking practices which would suggest a link between Critical Thinking and literacy practices of specific disciplines. I would suggest, therefore, that further research into what I would conjecture could be a symbiotic relationship between Critical Thinking and Academic Literacies would be a further path to follow in terms of examining Critical Thinking in the context of classrooms. This might be particular pertinent in the context of increasing academic literacy demands as implied above by the changes to A level qualifications.

8.4 Final conclusion

This thesis has attempted to address the apparent impasse that was presented in the literature between theoretical models of Critical Thinking and their transfer to classroom contexts by providing a close examination of three classrooms where teachers have engaged with a particular model of Critical Thinking, and thus it has provided an account of a grand pedagogical concept such as Critical Thinking in relation *to the practice of* it, to paraphrase Dewey (1934). It has been shown that Critical Thinking in this context cannot be pinned down into a single agreed definition, but that these teachers have themselves been

engaged in a critical and intellectual job of work by infusing and amalgamating Critical Thinking into their own professional and disciplinary contexts. As such, they have produced three different class based manifestations of Critical Thinking, all of which revealed the complex interplay between critical thinking as outcomes and Critical Thinking as pedagogical process. What can be concluded is that Critical Thinking has not, in this study, stood alone as a body of knowledge or content, but rather as a set of principles and procedures for thinking that have been subject to interpretation. Critical Thinking, therefore, in the practice presented in this thesis, assumed its value and significance by being embedded in the substantive content of respective A level specifications. Indeed, the key players in this research have not, after all, been Critical Thinking nor the A level, but the teachers themselves who have shown themselves to be the agents through which Critical Thinking as an abstract theoretical construct is transformed into their own enacted pedagogy.

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Appendices

Appendix A: Critical Thinking Professional Development Programmes based on Richard Paul's Critical Thinking Model.

Participant teachers in this study underwent one of two programmes developed within the school based on Paul's model of Critical Thinking as found in the materials and resources from the Critical Thinking Foundation (www.criticalthinking.org). These programmes were as follows:
The first tranche of the school based programme was developed and delivered over 2 years from 2007-2009 in which teachers M and L were participants throughout. The cycle was then subsequently run through 2008-2010 and 2009-2011.
Twilight sessions outlined below were delivered the first year in one hour half termly sessions; and in the second year, in two hour termly sessions. The time between sessions allowed teachers to trial out ideas which were fed back into subsequent sessions. As a result, the programme adopted an enquiry approach based on input, practice, and then review.
The sessions, as outlined in the overview below, took a specific aspect of Paul's model which was explicated and examined through a facilitative approach to professional learning. The Critical Thinking Foundation provides a range of resources including mini guides for various aspects of the Critical Thinking model and approaches (see figure below) and a selection of these provided the stimulus materials for the sessions.

(Downloaded from https://www.criticalthinking.org/store/ 12.8.17)

Overview of the programme (First delivered September 2007-July 2009 and then subsequently 2008-2010; 2009-2011).

	Session	Focus	Intersessional activity
Year 1	Autumn 1	Introduction to Tri-Partite model: Elements, Standards, dispositions. Introduction to the role of concepts.	Identify fundamental concepts for own subject.
	Autumn 2	Examination in detail of 'The Elements of Thought'. Understanding and practice of 'Reciprocal Teaching' approach.	Develop an activity/activities based on elements to try out in lessons. Use reciprocal teaching in lessons.
	Spring 1	Presentation of Elements activities and peer feedback.	Review, refine and trail further Elements activities

		Identification of 'next steps'.	as a result of learning from the session.
	Spring 2	Detailed examination of 'The Intellectual Standards' and their application to individual subject contexts. Practise and develop State/Explain/Exemplify/ Illustrate (SEEI) strategy.	Develop an activity/ activities based on The Standards to try out in a lesson/ lessons. Trial SEEI in a lesson/lessons
	Summer 1	Presentation of 'Standards ' activities and peer feedback. Identification of 'next steps'.	Review, refine and trial further 'Standards' activities as a result of learning from the session.
	Summer 2	Reflection on learning from previous 5 sessions. Planning for new academic year. Resource development/ modification of schemes of work.	
Resources for Year 1: - *The Thinker's Guide to Analytic Thinking: The Elements of Thinking and the Standards they must meet (*Paul & Elder, 2006a). - *The Miniature Guide to Critical Thinking Concepts and Tools (*Paul & Elder, 2006b)			
Year 2	Autumn 1	Remodelling 'standard' approaches to lesson planning lessons drawing on Critical Thinking tools and strategies.	Plan and teach a 'remodelled' lesson. Where possible obtain peer /student evaluative feedback.
	Spring 1	Presentation and peer feedback on remodelled lesson. Applying Standards/Elements to developing Socratic questioning.	Revised/ further examples of remodelled lesson plans. Trailing Socratic questioning. If possible set up a peer observation of lesson/lessons.
	Summer 1	Presentation and peer feedback on remodelled lessons and/or Socratic questioning approaches. Examination of the Intellectual Traits and their role in student learning. Identify a 'relevant' trait and exploration of how this might fostered by our teaching.	Further trialling or remodelled lesson plans/ Socratic questioning. Trial approaches to foster an identified 'intellectual trait'.
Resources for Y2: - *Critical Thinking Handbook: High School A Guide for Redesigning Instruction*- (Paul, Binker, Martin & Adamson,1995) - *The Thinker's Guide to the Art of Socratic Questioning Based on Critical Thinking Concepts and Tools (*Paul & Elder, 2006c*).* - *The Miniature guide to Critical Thinking Concepts and Tools* (Paul & Elder, 2006b).			

As a result of the work conducted at the school on Paul's model of Critical Thinking, teacher M and L and myself were partially funded by the school to attend the International Conference on Critical Thinking run by the Critical Thinking Foundation in July 2009.

In September 2011 L school was conferred with National Teaching School Status. The Critical Thinking programme was incorporated into the suite of training programmes offered to teachers from a range of schools under that aegis. This provided me with an opportunity to review, modify and clarify the objectives of the programme which was delivered termly over the course of four sessions: three half days and one full day, as outlined below. Teacher J was a participant on this programme the autumn term of 2011.

Session	Focus	Objective	Session/intersession activity
1. (Half day)	Introduction to model: Elements, Standards, Role of concepts	Participants have a clear idea of: 1.Basic concept of Critical Thinking – 3 part model 2. Role and purpose of the study group 3. Role of concepts as 'content organisers'	1.Clarify expectations 2. Articulate expectations of students as thinkers 3. Make links between expectations and pedagogy 4. Define core concept for own subject 5. Implications of definitions for how/ what you teach
	Examination of 'the elements'	1. Clear understanding of each of the elements 2. Ideas on how to apply to own lessons 3. Understanding of 'reciprocal teaching' method	1. Reciprocal teaching of 'elements' 2. Develop an activity/activities based on elements to try out in lessons 3. Use reciprocal teaching in lessons
	Feedback on element activities	1. Deeper understanding of elements and their application 2. Learn from peer feedback	1. 'Teach' elements' activity tried out at school. 2. Peer evaluation of activities. 3. Try out 'next steps' resulting from reflection on elements activities
2. (Full day)	Examination of the standards	1. Understand what each standard is 2. Understand standards in context of own subject 3. Develop SEEI as a learning strategy	1. Map standards across subject PoS/specs. 2. SEEI/read/discuss/teach standards 3. Develop an activity/ activities based on the standards to try out in a lesson/ lessons 4. Use SEEI in a lesson/lessons
	Observation of lesson using CT	Critically evaluate application of CT in a lesson. Identify implications for own practice.	
	Feedback on standard activities Apply Standards to Elements	1. Deeper understanding of the standards and their application in lessons 2. Learn from peer feedback	1. 'Teach' standards activity tried out at school 2. Peer evaluation of activities. 3. Try out 'next steps' from reflection
3. (Half day)	Socratic Questioning	Understand characteristics of Socratic questioning Develop use of Socratic questioning using Elements and Standards.	1. Peer teaching 2. Practise Socratic questioning technique in learning trios 3. Plan and carry out Socratic questioning activity in lessons.

	Examination of the Intellectual Traits	1. Deepen understanding of application of Socratic questioning technique 2. Understand how traits are integral to CT 3. Understand role of traits in the classroom	1. Group feedback on Socratic questioning activity 2. SEEI and peer assessment of traits 3. Plan and carry out activity promoting a trait/traits
4. (Half day)	Planning for further development	1. Understand principles supporting successful transfer of learning. 2. Apply principles to inform action planning	Group feedback on traits Evaluate CT programme based on principles of transfer Action planning for how to continue with CT.
Resources: - *The Thinker's Guide to Analytic Thinking: The Elements of Thinking and the Standards they must meet (*Paul & Elder, 2006a). - *The Miniature Guide to Critical Thinking Concepts and Tools (*Paul & Elder, 2006b) - *The Thinker's Guide to the Art of Socratic Questioning Based on Critical Thinking Concepts and Tools (*Paul & Elder, 2006c*).*			

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Paul, R. & Elder, L. (2006c). *The Thinker's Guide to the Art of Socratic Questioning Based on Critical Thinking Concepts and Tools*. Dillon Beach: Foundation for Critical Thinking.

Appendix B: Sample of A level Specifications and Critical Thinking Requirements.

'Criticality' as featured, but not operationalised, in a range of A level specifications beyond those examined in more detail this study, in use at the time of the research in 2013.

GCE Art and Design, (OCR, 2013)
Includes as aprt of its aims 'to encourage candidates to develop investigative, analytical, experimental, practical, technical and expressive skills, aesthetic understanding and ***critical judgement*** (p. 5)

Assessment objective 4 constitutes:
'presenting a personal, informed and meaningful response demonstrating ***critical understanding,*** **r**ealising intentions and, where appropriate, making connections between visual, written, oral or other elements' (p.35)

GCE Music (Pearson, 2013)

Grade A/B performance descriptors include:
'Candidates characteristically …make ***critical judgements*** about music heard and show a breadth of understanding across the genres, styles and traditions studied' (p.134).

GCE AS/A level Mathematics (AQA, 2013)

Assessment Objective 4 comprises: 'comprehend translations of common realistic contexts into mathematics; use the results of calculations to make predictions, or comment on the context; and, where appropriate, ***read critically*** and comprehend longer mathematical arguments or examples of applications' (p.17).

GCE AS/A Level Psychology (OCR, 2013)

Performance descriptors for the A/B grades includes 'candidates characteristically… ***comment critically*** on statements, conclusions or data' (p. 38).

GCE AS/A Level English Literature (AQA, 2013)

Top band descriptors for the highest grades include 'candidates characteristically…confidently explore through detailed and sophisticated ***critical analysis*** how writers use these aspects to create meaning' and 'structure and organise their writing using an appropriate ***critical register'*** (p.15).

Appendix C: Ethical Approval

21st February 2013

Lynne Isham
Department of Education & Professional Studies

Dear Lynne,

REP(EM)/12/13-37 'An ethnographic perspective study into teachers' enactment of Critical Thinking courses based on Richard Paul's trans-disciplinary approach to Critical Thinking'

Thank you for submitting your amendments to the Research Ethics Office. I am pleased to inform you that the above application has now been granted FULL APPROVAL by the E&M Research Ethics Panel.

Please ensure that you follow all relevant guidance as laid out in the King's College London Guidelines on Good Practice in Academic Research (http://www.kcl.ac.uk/college/policyzone/index.php?id=247).

For your information ethical approval is granted until 21/02/15. If you need approval beyond this point you will need to apply for an extension to approval at least two weeks prior to this explaining why the extension is needed, (please note however that a full re-application will not be necessary unless the protocol has changed). You should also note that if your approval is for one year, you will not be sent a reminder when it is due to lapse.

Ethical approval is required to cover the duration of the research study, up to the conclusion of the research. The conclusion of the research is defined as the final date or event detailed in the study description section of your approved application form (usually the end of data collection when all work with human participants will have been completed), not the completion of data analysis or publication of the results. For projects that only involve the further analysis of pre-existing data, approval must cover any period during which the researcher will be accessing or evaluating individual sensitive and/or un-anonymised records. Note that after the point at which ethical approval for your study is no longer required due to the study being complete (as per the above definitions), you will still need to ensure all research data/records management and storage procedures agreed to as part of your application are adhered to and carried out accordingly.

If you do not start the project within three months of this letter please contact the Research Ethics Office.

Should you wish to make a modification to the project or request an extension to approval you will need approval for this and should follow the guidance relating to modifying approved applications:

http://www.kcl.ac.uk/innovation/research/support/ethics/applications/modifications.aspx
The circumstances where modification requests are required include the addition/removal of participant groups, additions/removal/changes to research methods, asking for additional data from participants, extensions to the ethical approval period. Any proposed modifications should only be carried out once full approval for the modification request has been granted.

Any unforeseen ethical problems arising during the course of the project should be reported to the approving committee/panel. In the event of an untoward event or an adverse reaction a full report must be made to the Chair of the approving committee/review panel within one week of the incident.

Also, please note that we may, for the purposes of audit, contact you from time to time to ascertain the status of your research.

If you have any query about any aspect of this ethical approval, please contact your panel/committee administrator in the first instance (http://www.kcl.ac.uk/innovation/research/support/ethics/contact.aspx). We wish you every success with this work.

Yours sincerely

Rosie Pearson
Research Support Assistant

Appendix D: Question prompts for semi-structured teacher interviews.

Tell me about what you think are the distinctive features of your subject at A level, as opposed to GCSE (where relevant).
(Content / conceptual understanding/ reasoning/ literacy demands?)

What do you understand by 'thinking critically' in your subject?

Tell me about your use of the Critical Thinking model in your teaching?

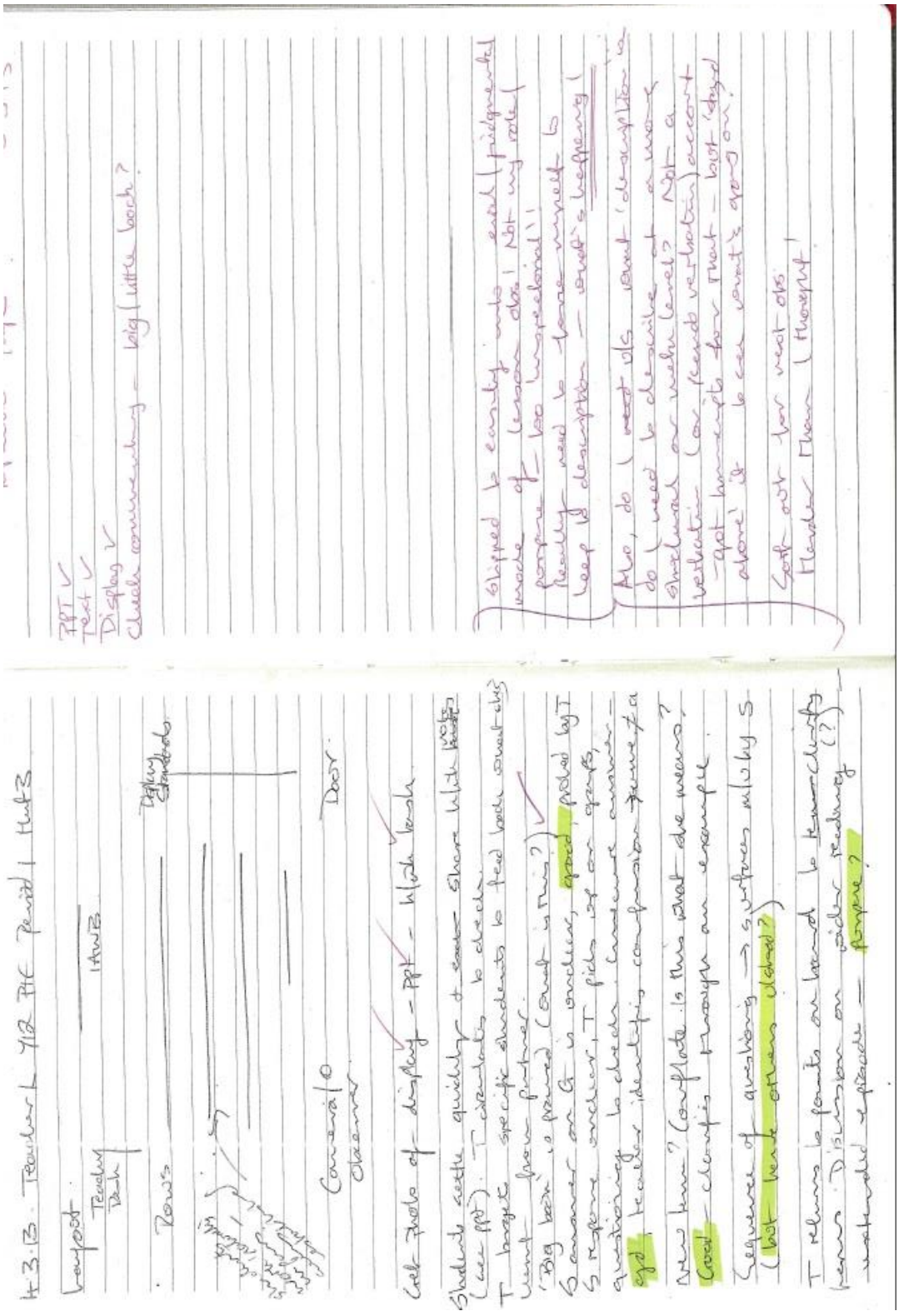
What have been blockers and/ or enablers in your use of the Critical Thinking model?

What would you say has been the impact of how you have used (features of the Critical Thinking model in previous answer)] on your students?
(Specific examples/ reasons for this evaluation?)

If you could develop your teaching in any way you would like, what would you do? Why?

Appendix E: Reflexive commentary on my role as researcher/ observer.

Extracts from my research journal relating to early observations indicated a reflexive process in terms of evaluating and developing my role as observer in a research context.



Reflexive notes (on the right hand page) identify an initial evaluative and judgemental approach to observation not in keeping with an ethnographic approach to research observation.

Reflection on my subsequent observation notes (on the far right side) indicate a more disciplined approach to describing what is happening. However, I demonstrate an awareness of a risk over over-interpreting too early on in the data collection.

Appendix F: Lesson Details

Further details of lessons featured in the case study chapters (chs. 4-6)

M. 11.3.13

The data used from this observation was the second 45 minutes part of a double 90 minute lesson. The first 45 minutes had been spent working on examining the viewpoint of Social Conservatives in the US in which students had had to draw an illustration embodying the key aspects of such a point of view. The second part of the lesson was focusing on Fiscal Conservatism. Students had prepared for the lesson by reading and making notes the relevant sections from the set textbook, *US Government and Politics* (Storey, 2007). There were six distinct phases to the second part of the double lesson, outlined as follows:

Topic	Activity	Timings
The world view of Fiscal Conservatives	Students already working on drawing an illustration which conveys the world view of Fiscal conservatives. Each student draws his/her won but discuss their ideas in pairs. Teacher circulates and interacts with individual students and pairs to question, clarify, discuss their illustration.	2 mins.
	Whole class brainstorm of key ideas arising from the illustration, led by the teacher.	1 min
	Students move from the 'discussion table' to space out around the room in pairs. They discuss their answers to questions on the whiteboard based on 'the Elements of Thought' to develop understanding of fiscal conservatism. They make independent notes unprompted by the teacher.	12 mins.
	Teacher led whole class discussion of answers	16 mins.
	Students revisit their original illustrations and make amendments in the light of the class discussion. Teacher circulates to ask individual students about changes made. Some examples are shared with the whole class.	3 mins. 2 mins.
	Setting homework task on developing a questionnaire to assess someone's viewpoint – as a Fiscal Conservative or a Social Conservative. Examples led by the teacher, then students released to work on their own questions in pairs	8 mins.

M.26.4.13

The data used from this observation was the first 45 minutes of a 90 minute double lesson. The organisation of this lesson was based around preparing and improving exam answers. The first part of the double lesson was divided into two key sections: 25 minutes critiquing a students' exam answer; the second 20 minutes (continuing into the second part of the double lesson not observed) was setting up a second exam type question for students to complete for homework.

Within this bi-partite structure there were seven distinct phases to the lesson as outlined below:

Topic	Activity	Timing
'Why has the impact of professional lobbyists on policy-making in the USA been controversial?' Peer critique	Individual annotation of a photocopy of one student's written exam answer	8 mins.
	Class discussion based on the strengths and areas for development of the answer	9 mins.
	Individual reflection and annotation of own answer to rewrite for homework	8 mins.
Reviewing knowledge	Individual brainstorm access points to the Senate.	5

and understanding of the relationship between the Senate and pressure groups in preparation for a written exam question 'How and why do pressure groups attempt to influence the Senate?	Recorded on individual post-it notes	mins.
	Pairs discuss and classify answers in order of significance. Teacher circulates to engage with different pairs	8 mins.
	Pairs classify answers into 'how' and 'why'. Teacher circulates to engage with different pairs. Continues as observation ends.	7 mins.

M. 13.5.13

The data used from this observation was the first 45 minutes of a 90 minute double lesson based on preparing a final topic for the exam on Race and US politics. Students had prepared for the lesson by reading and making notes on a chapter from the set textbook, *US Government and Politics* (Storey, 2007). The 20 page chapter comprised of sections on:

(i)The impact of slavery and segregation
(ii)Responding to exclusion from society
(iii) The struggle for integration
(iv) Constitutional issues raised by the end of legalised segregation
(v) The development of Affirmative Action programmes
(vi) Resistance to Affirmative Action
(vii) The current political debate on Affirmative Action.

The first part of the double lesson was divided into three parts as follows:

Topic	Activity	Timings
Race and US politics	Students watcha short cartoon clip *A Brief history of the USA* (https://www.youtube.com/watch?v=Zqh6Ap9ldTs) taken from the Michael Moore film *Bowling for Colombine.* The clip presents a satirical whistle stop tour through American history from the arrival of the Pilgrim Fathers and suggests ways in which racial fear has shaped US attitudes, especially in relation to gun ownership.	4 mins
	Paired discussion on the perspective presented in the cartoon	3 mins
	Class discussion on perspective presented in the carton led by teacher	10 mins
	Paired reflection on key concepts pertinent to what has been presented.	2 mins.
	Class discussion on relevant key concepts led by teacher	9 mins.
	Small groups identify key events within an allocated time frame in relation to race. Record on post-it notes.	10 mins
	Groups come together to organise events chronologically (Continues after observation).	5 mins.

J. 7.3.13

The data used from this observation was the first 45 minutes of a 90 minute double lesson. The lesson focus was on the topic of vision, following a previous lesson on the anatomy of the eye; how the eye works; and the process of dark adaptation (in other words, the neurological processes which result from moving from the light into the dark, and then back to the light again). J, in his commentary, ascertained that the lesson being observed was a 'recap' lesson to ensure students could consolidate the propositional content of the previous lesson.

The first part of the double lesson was divided into 2 distinct topics: Dark Adaptation and Perception. These in turn were structured around a series of paired discussions based on questions given by the teacher, and then whole class feedback led by the teacher. As such, the structure of the lesson could be represented as follows:

Topic	Activity	Timing
Dark Adaptation	Paired discussion of question 1: You're sitting in a room over a period of time and you begin to see more detail. Explain why	6 minutes

	Whole class feedback	7 minutes
	Paired discussion of question 2: Someone then switches on a light. Describe and explain the body's responses	4 minutes
	Whole class feedback	6 minutes
Perception	Paired discussion of questions: What is stereoscopic vision? What helps us see images over 30 metres away	6 minutes
	Whole class feedback	3 minutes
	Paired discussion of questions: What is the carpentered world hypothesis? What are the two theories why the Zulu people do not fall for the Muller-Lyer illusion? How does the 'Visual Cliff ' experiment suggest that some innate perception of depth is produced genetically?	6 minutes
	Whole class feedback.	6 minutes (continued after observation for the research finished)

J. 25.4.13
The data used comes from the first 45 minutes of a double 90 minute lesson. The lesson was based on exam preparation and revision, as presented below:

Topic	Activity	Timings
Students work on individual topics across the specification based on their own self-assessment .	Students identify a topic of weakness based on performance in previous A level mock exam and find exam questions from other papers related to that topic from the A level past paper folder on the school's intranet.	Prior to the lesson
	Teacher introduces a revision structure for the lesson	7 mins.
	Individual/paired work on identified topic. to secure understanding. Teacher circulates.	20 mins.
	Teacher clarifies difference between understanding and recall; explains what 'recall' should look like.	3 mins.
	Students working individually on exam questions they have brought to the lesson on their identified topic. Teacher circulates.	15 mins (and continues after observation).

J. 9.5.13
The data used comes from the first 45 minutes of a double 90 minute lesson. The lesson was based on exam preparation and revision, as presented below:

Topic	Activity	Timing
Ventilation	Teacher reminds students of the Comprehension/Recall/Apply approach to their revision work in the lesson	2 mins.
	Self- assessment on exam questions on ventilation. Students rework areas of weakness. Teacher circulates.	15 mins.
Students work on individual topics based on their own self-assessment of answers from any	Peer testing to check recall of identified topic.	20 mins.
	Teacher moves students onto applying knowledge to new exam questions.	8 mins. (continues

topic in the mock exam paper.		after the observation).

L. 4.3.13
This particular lesson was at the end of a unit on ontological arguments for the existence of God. The structure of the lesson was as follows:

Topic	Activity	Time
The Ontological Argument.	Peer feedback on homework task on revision Sheet on perspectives on the ontological argument	7 mins.
	Whole class feedback on key ideas covered in peer discussion	6 mins.
	Paired close reading task of an extract on the ontological arguments from Jones, Hayward & Cardinal (2005), p.26. (see text 1 below)	24 mins.
	Whole class feedback of outcomes of paired reading task	8 mins.

L. 27.3.13
This lesson was the first lesson in which students worked on Kant's Moral argument for the existence of God. They had already covered Kant's ethical framework as part of the AS unit on Ethics taught by another teacher.

Topic	Activity	Time
Kant's ethical framework	Whole class feedback on homework task revising Kant's ethical framework	3 mins
Kant's Moral Argument.	Reciprocal Teaching task introduced and procedures made explicit	6 mins
	Students individually read their section of a text on Kant's Moral Argument for the existence of God(see below) and make written notes. Teacher circulates to check homework notes.	13 mins.
	Students explain each pairs their respective section of the text. Teacher circulates to monitor interactions.	8 mins
	T gives instructions for writing task	1 min
	Students work in pairs to construct an essay paragraph based on their learning from the reciprocal teaching task. Teacher circulates to monitor students' work.	11 mins
	An example of student paragraph read out by student to class.	2 mins

L. 19.4.13
This lesson had as its main topic St Augustine's theodicy in which he attempts to reconcile the existence of an all knowing and merciful God with the existence of evil. Privation and Free Will were the two key concepts explored in this lesson.

Topic	Activity	Time
St Augustine's Theodicy	Teacher led whole class Q&A on the biblical story of The Fall from Genesis using powerpint slides	9 mins
	Students to record on worksheet in their own words Augustine's concept of 'privation' and record their own examples.	5 mins
	Whole class feedback on the meaning of the concept of 'privation'. T makes explicit link to Augustine's use of the term.	5 mins
	Teacher introduces second key concept of Free will through explanation supported by whiteboard slides.	4 mins
	Students present a close reading task of a quote by St Augustine's on Free Will. They complete this in pairs on their worksheet. Teacher circulates and interacts with students as they complete the task.	18 mins.
	Teacher led whole class feedback on each section of the quote.	4 mins.
	Homework set to continue to evaluate the theodicy as covered so far in the lesson.	

Text 1: Ontological Arguments

Jones, Hayward + Cardinal (2005)

Ontological arguments

Introduction

In this section we look at ontological arguments and the criticisms made of them as they developed from the time of S Anselm through to Descartes. We shall also briefly look at modern perspectives on the arguments.

Ontological arguments for God's existence are supposed to be deductively valid. In other words, if we accept their premises as true, the conclusion is said to follow necessarily. Such arguments, if successful, would clearly represent an incredible achievement for human reason, for they promise to establish God's existence with absolute certainty! However, as we saw above, before we can be certain that they succeed we need to be sure that the premises used in such arguments are true. But ontological arguments also claim that their premises are unassailable since they concern only definitions and the analysis of concepts, and specifically the analysis of 'God'. Because we can examine the concept of God in a purely *a priori* manner it represents a firm starting point for our argument. Thus an ontological argument should establish the existence of God with the same degree of certainty as is to be found in mathematics.

But how can we begin from premises that are knowable purely *a priori*? Surely, we would need to begin with some experience of the world before we could establish the existence of anything. If we want to know whether the Black Panther of Bodmin Moor exists then we examine eye-witness accounts, assess the video footage, carry out autopsies on the savaged lambs, and perhaps even recruit thousands of foolhardy students to trawl across the barren hills searching for panther droppings and paw prints.[23] On the basis of the empirical data (the experiences) that we have gathered we then build up a case for, or against, the existence of the beast. So here the proof of the existence of the Black Panther begins with evidence obtained *a posteriori*. However, an ontological argument claims to establish the existence of something (namely God) without drawing on any observation, evidence or experience. How is this possible?

Unpacking concepts

The ontological argument works by analysing the concept of

Text 2: Kant's Moral Argument

Not only are we aware of this moral law, Kant said we feel an obligation to obey it because it is the rational thing to do. To discover the right action we must apply moral reason, this will reveal the moral law and gives us the **categorical imperative** which we should obey (see page 107).

Duty, Kant said, is doing a good action for no other reason than we know it is our duty. Sophie visits her granny simply because it is her duty as a granddaughter. Duty is not a response to threats or rewards. If Sophie acted because her mother nagged her or because it made her feel good or she did it out of love, Kant said this would not be a virtuous action. Virtue can only be duty for duty's sake.

Why are we moral?

According to Kant, humans are obliged to carry out virtuous actions from a sense of duty, not because they expect a reward. Indeed we know from experience that whilst we can carry out a virtuous action, there is no guarantee it will always lead to happiness. Yet it is logical for a virtuous action to be rewarded by happiness eventually. This state, when virtue and happiness do come together, Kant called the **Summum Bonum**. Kant reasoned that because the summum bonum is rarely achieved in one lifetime, then logically there must be an afterlife in which to achieve it.

Kant considered his argument had three necessary parts, which he called **three postulates**.

Three Postulates of Morality

Freedom
Kant said a course of action is only moral if a person is free to carry it out. Sophie exercised her free will, when deciding to visit her grandmother, without rewards, threats or pressures. Also she was able to undertake the visit. If she had been unable to visit through lack of transport or illness then no duty would exist.

Immortality
Experience tells us that virtuous actions are not always rewarded by happiness, indeed they may attract criticism or pain. Since perfect virtue ought to result in perfect happiness, then it must exist. Because it doesn't happen in this life, it follows that God must provide it in the next life.

God
For Kant it follows logically that if there is another life in which humans can achieve immortality, then this means God is the necessary connection between virtue and happiness which is implied by the summum bonum.

Kant's Moral Argument for the existence of God

It is logical for perfect virtue to be rewarded by perfect happiness. → Humans cannot achieve the summum bonum without God and an afterlife. → God must exist to provide the summum bonum.

KEY WORDS

Categorical imperative involves making a moral decision from a sense of duty without any consideration of the outcome.

Summum bonum is the state of supreme good when virtue and happiness come together.

Postulate is something which is an assumption, it is probable but not provable.

ACTIVITY

AO1 skills

Explain why it would be wrong to describe Kant's Moral Argument as proof of the existence of God.

STRETCH & CHALLENGE

AO2 skills

Explain what Kant meant when he wrote:

'It is impossible to conceive of anything at all in the world, or even out of it, which can be taken as good without qualification, except a good will.'

Do you agree with him?

Appendix G: M.25.2.13

Teacher M's Interview Transcript

R: Ok, thank you, M for agreeing to em...er… being part of this research.

The purpose of the... this interview is …is to really to listen to you talk about your subjects and particularly the requirements at A level and then what you've done with Critical Thinking and how that relates or not to the work...em...er required at A level. So, could you sort of just outline what are the distinctive features (.) of your subject at A level so we're talking about politics…em… which students don't do at GCSE. What is it that sort of…what is it that's the distinctive feature of the A level (.) course in politics?

T: Em, I think it's …er it's a... er ..a very wide ranging body of knowledge that students need to build up in the first inst…instance, and then they need the ability to …em to… to analyse that information… em...in order to create persuasive… persuasive [arguments

R: mm]

T: and so draw drawing from… from that analysis they then need to be able to construct sustained [arguments.

R: em...em]

T: in essays in order to evaluate different… different… em …opinions for example on the extent of a prime minister's powers

R: Mm

T: So…em yeah so it really operates a… at that(.) level and in in terms of er…a sort of model a model of progression through it…em in order to get an E grade students would need that bedrock of [knowledge

R: right]

T: and understanding. A C grade is draws on those analytical skills and an A grade is you know sort of nailing those sustained arguments throughout essays=

R:=and in terms of the sort of content, just briefly outline the, the content of the of the course.

T: Em so em…er I always think the content can be divided up into two types of evidence if you [like

R: mmm]

T: Em there's the kind of er … procedural evidence about for example how

parliament works=

R= Right

T: Em so you know sort of er the, the size of parliament, em particular parliamentary processes em … and then there's the case study evidence for example looking at times when a ...a government has been defeated in parliament, times when a prime minister has lost control over parliament…em you know so to…to get a high grade students need to em master em evidence of… both well both types of [evidence.

R: mmm] and em (.) what sort of…so, so that's, that's the sort of like the content in terms of knowledge, what are the sort of ...what would you identify as the sort of core concepts that need to be (.) mastered and understood?

T: Em so you…I've...I've drawn up a kind of concept map for politics which [includes

R: right]

T: Em…well it's based around the ideas of power, representation, accountability, democracy, representation, pluralism, have I said accountability? Rights and [participation

R: right=]

T: =And so I.. I try to be quite explicit with sharing that with students and so they can build up their own conceptual framework, so by the time they're in Year 13…em … then they're ... you know…able to perform their own analysis and if we're talking about, I don't know, say something like why…er… how significant is Congress,then immediately there's so many angles that students can go down and the concepts provide a sort of .. er… a structure for making coherent all the evidence (they've) built up about both case studies and…and procedural evidence.

R: Right. Ok. So, if you had to (.) em if you had to sort of almost like define or explain what does it mean to think critically in politics what…what would it be? what would it look like?

T: I think it would be an ability for… sort of… to relate that mass of evidence [content] to...to...particular concepts …em … to show that they can think politically=

R: =mmm=

T: =em so if you're...you're looking at an issue such as gay marriage in America, you're not analysing necessarily the rights or wrongs of it, you're not arguing the ethical or moral case, it's about looking at the significance of the issue in elections… em …using it to illuminate how the Supreme Court works, for example… em ...looking at it… em… to see how issues…er … how minority issues can become mainstream issues through a variety of political processes and mechanisms. Em then…so, what I would then hope students are able to do is to … em …use that…use a variety of er…of ...of case studies and different forms of evidence in order to make much wider judgments about the nature of the political system and how it's working…so they might use em the fiscal deficit in America as a case study of em you know...sort of to...to...to suggest

whether or not the American political system is broken, whether it serves the purposes it was built for, so that's really a big synoptic [question

R: right]

T: which permeates say my teaching of American politics. So you know the best students in a class will be able to link in what we're doing to those big synoptic questions.

R: So, in terms of the sort of Richard Paul Critical Thinking model what...em… just talk a bit about (.)em how long you've been using it, how you've developed it, what you use it for.

T: Mmm, so...em I'd say that (.) the...the Paul model, it certainly ...it certainly helps when you come to look at a new topic, you know, sort of, you could…em… take something like em an institution like em the cabinet and having the Richard Paul model in mind so that it creates ...it gives you an analytical framework to actually plan the lesson em so...so you would think first about what ...what's the purpose of cabinet, em what are the key questions raised by a cabinet, em what...what em evidence do we have about how it operates, em what conclusions can we draw any ...any different perspectives as whether Liberal or Conservative on the way that the cabinet works. Em, so certainly in terms of planning the lesson it, it really helps to inform things and…er yeah...that's the, the main aspect. Em (.) I'm not always sure that I've used it so explicitly as I would have liked to …em …and I think that's something that I'm always trying to develop...em because em it...it exists there and I try to you know make clear to students why we're following a particular structure …em and sometimes I'll give them that structure to you know sort of analyse something quite independently.

R: What stopped you from using it explicitly?

T: Em, I think probably just the need ...em…to relate things to exam questions =

R: = right=

T: = and then just say the content coverage em...it's that classic dilemma of how far ...how far you can build the wider skills you would hope that students build up em… when the exam is looming.

R: Right...so you've used the elements then as sort of like a structure for planning lessons or new topics. Whatabout... em about other aspects of the, the model… about the Standards?

T: So in terms of Standards, we do a lot of… em peer review of students' work so typically em… the way I do assessments is em…so students will… students will make notes on a particular section in their textbooks...or from
their textbooks… and then they'll bring that in for a lesson and that's ...that's when we really analyse the material in front of us and relate it to…to the concepts. Em … then I'll introduce an exam question... em students will then apply the knowledge and understanding to the exam question, I'll send them away to go and write that up and next lesson. Then, typically I'll take someone's…em essay, photocopy it for everyone, and then we'll peer assess that... em and I'll encourage students to give formative comments to each other, and that's where the Standards become really important because I think I think it really helps to provide that framework for analysis ... em for what makes good work and I think that's something I've built up over time by making

explicit reference to the Standards em...so ...now I don't really provide any prompting yet students are I'd say …er are quite skilled now at you know sort of using the critical thinking Standards in order to assess each other's work. So then after that, they get a chance to redraft their work and to put into practice formative comments and then (unclear) hand that in and mark it and give them a summative comment.

R: So, so would it be fair to say that the Standards you do teach or use much more explicitly than [necessarily

T: Yeah]

R: the Elements?

T: Yeah, yeah absolutely and that's something because I've taught…em this, this class for… this is my second year of teaching them it's,it's [built up over [time

R: Right…yeah] So I've, you've sort of mentioned one...one em blocker or something that stops you doing what you want to do which was the amount of content, what else in terms of developing your use of Critical Thinking have you found that has enabled it or that's…or that's (.) blocked it in any way?

T: Em (0.9) I'd say (.) em...I think the enablers… are well…is the stimulus in the first place, so you know attending the CPD sessions in school, then attending the conference in California em…so you know…both of those have allowed me to build up that em you know sort of...you know that repertoire of different techniques em and then continuing to work with other teachers across departments to promote it has always forced me to think back through to my own practice. Em, so, you know...those, those are enablers. I'd say for blockers, I think where things start to ...to fall apart a little bit is maybe where, say my Y12 class at the moment I don't think I've done as much on Critical Thinking as I'd done with my last Year 13 because their target grades are often in the D /E range and so the battle there is merely to comprehend em the basic knowledge and understanding ...em… and though there are some students who...one or two students whose targets are B grades in that class em…sort of... who I can give...give different homework for which requires them to analyse and evaluate different opinion pieces, em , for the most part in the class the battle is simply to comprehend the...the material so that they can acquire that...that basic knowledge. Em and so I think there is a big difference in the way that I teach classes according to the sort of ability profile as there are still, you know sort of, opportunities for that higher order thinking in class but they're perhaps less common than they would be in a class with perhaps er...a more er…upward range of ability.

R: When you talked, just to go back a little bit, when you talked about enablers working with others, can you sort of talk about other teachers or…that you've worked with in terms of er...developing Critical Thinking.

T: Em, so I've worked with members of the Science [department

R: Right]

T: Em on it and so...em ...em as well as recently a member of the Geography department and I think that whenever you do that... em… it really forces you again to reflect on your own practice...em and just you know ...sort of… it makes you think ...well… am I always following best practice? Em and am I consciously trying to you know develop my own

strategies? Because I think when you've been teaching a course for a number of years there is a danger that you...you sort of fall back into sort of old habits or you become less …less adventurous or experimental in your own teaching and so it really forces you to reflect on…on the way you teach yourself.

R: Okay, and what about the impact that you noted on ...on students. How…what...what contribution does it make towards their thinking, their reading, their writing, you've talked about what you expect of them in terms of reading and writing. What have you noticed if anything in terms of either what they contribute or produce?

T: Em…I think it does…it certainly helps their analysis so...I'm thinking of a lesson earlier where in History where we have say four core concepts and ask students to write their own narrative of a period em and so this is a revision activity and so I ask them to…to do quite a lengthy piece where they basically link up all different events in chronological order but ask them to analyse by relating what…what had happened to the concepts (unclear) for example to explain whether Britain's imperial power had strengthened or weakened, em you know...with a particular event or individual coming onto the scene em…or for example, whether sectarian tensions em... between Hindus and Muslims had...had got worse or got better with...with a particular ...with a particular event. And so...I ask them to be very explicit in their analysis and for most part they were...they were able to do that and quite...quite accurately and go into depth and explore the significance of different...different events, and from there they could start to analyse the longer term trends and that was, you know, sort of a ...the purpose of today's lesson was to use their narratives...em... to get them ...em ...to em… evaluate viewpoints over the entire period em...and so...that there was a real progression and I saw that students with some prompting and encouraging you know, were able to express an analytical point about the period because one of the questions, one of the viewpoints was that...er… Britain er… that the withdrawal...the withdrawal of the British from India was inevitable by 1930 =

R: =Right

T: Em…and so... a weaker students would say, 'Yeah, my point is the Amritsar Massacre' but really that's not a point, that...that's evidence, and so what I was trying to get them to do, and what some students were able to do was to say ,'well the point is that Britian lost its imperial authority over its Indian subjects and the evidence for this is…you know...what happened at Amritsar' and then they would explain how that ...how that meant Britian lost its moral authority. Em...and so...yeah it...it (.)

R: So the concept provides the hook, [basically

T: Yeah, absolutely] yeah, the concept...throughout the course there is so much to learn in terms of…er a factual body of knowledge that...that the concepts structure the thinking throughout the course and…and structure, most importantly, structure the response to synoptic questions which otherwise students really struggle with because there's an overwhelming mass of information. Another synoptic question might be about em.…er... say the partition of India and about whether that was caused by a particular event. Em so what students…what…what say you know what some students would do would be just to pick out an event and explain how it led but...to…to partition, but other students would evaluate that viewpoint and…em and well evaluate that and say well it's important butit's not the only

reason and then they'd be able to draw on their wider knowledge of sectarianism throughout the period and say these are three or four other really important events which furthered sectarian divisions and so it provides the sort of framework and the structure for the way in which students think through the course.

R: Mm okay. Em sort of the last main area I sort of wanted to ask you about is is...if you could...you've talked about the constraint of the content of the syllabus, if you could develop your teaching in any way you'd like in an ideal world, what would you do? What would you do differently and why?

T: I think in an ideal world, if I was thinking about politics, em... I think I'd like to branch off and …and have a system where you could encourage students to apply their core political understanding of concepts to other political systems because I think that would be a real test. If, for example, you know you presented them with a load of information about France and suddenly they had to analyse, you know, sort of well, how...how powerful it is for the French government ...sort of how accountable is it to…to the public. And if they had to then...that would be intellectually a very challenging task. Em…you know...I guess ultimately there's no reason why I couldn't do it in class but for...for the demands of the exam because it would be tangental to...to...to...to the...yep…to what's on the prescribed content.

R: One point I meant to ask when you were talking about students is that...I suppose in politics it's different because they haven't done it before...em so they haven't got a GCSE experience to compare it with, but do you notice ...how do students respond to the challenge that you present with the way that you're teaching through concepts…and so on °

T: Em… there can be a lot of resistance at first...em ...so students can be quite skeptical about the idea...em because it is something that's new. I think over ...over a number of weeks they do see the value of it because they can see...they can start to see the difference between merely comprehending something and analysing something and that's what...you know...one of the strengths using the concepts (I think) ...it allows students to think 'Am I merely regurgitating what I've learnt here or am I actually independently thinking through this?' And that's always the difficulties with...with...well that's always the difficult transition between GCSE and A levels is that in my experience you can get an A grade, probably not an A*, but an A grade at GCSE History by being very good at remembering things and then reciting them back. You can't do that on the A level and so you have to become more skilled and so, yeah, students...students do pick that up and I think once they're…they've overcome that sort of resistance and do start to appreciate that.

R: One thing I haven't asked which is about the A star specifically, em...do you...have you had the opportunity to yet to distil that distinction between the A and the A star in terms of politics

T: Mmm

R: Or in terms of History? You don't teach Year 13 History do you?

T: No, no I don't but yet to get a strong A grade in Y12 History it really comes through having a master...a real mastery of the period and all its nuances and I think that's what marks out a sort of em....an A grade students from an A star student. I think you can be an A grade student by, in effect, knowing and understanding the

textbook inside out em... being able to analyse the key themes using the concepts. I think an A* student, what they do, especially as my paper is source based, is…er …is to perform...well to have done the wider reading around the subject and so immediately be able to locate a source in its… in a deep historical context. And I think it's the same in...in politics in that you know an A* comes from em…really knowing the nuances of a political system and being very much able to be synoptic both about the…the wider political system, so that if you're looking at a question such as the…the power of the president and you're able immediately to locate that in this broader question of whether American politics is broken, whether it's become too, too polarised, you're able to link that question to ...to the bigger question. You're also able to do what we call micro-synthesis which is ...or microsynopsicity which is where you take a...an example of the president's power em…say for example Barak Obama…em… issuing an executive order…em …to...er to stop the deportation of young Latinos and…you know...an A grade student would use that detailed example to illustrate that the president does have power, an A* students would explain the difficulties of relying on that mechanism as a crux of presidential power.

R: Right, okay, so it's that sophist...that level of sophistication

T: Yeah..Yeah

R: Okay emm ...I think I've covered the things I've wanted to, I don't know if there are things you want to add or say that...about the teaching of politics or history or Critical Thinking that we've not covered.

T: Em (0.4) I think one of the most important things is it's, say having been on Critical Thinking courses, is...is what it's done for me is to help me appreciate the difference between comprehension and the analysis and the evaluation and then to share that with students...em and so, what I'm now very keen on doing is er...say, making sure that students perform the ...the...the building up the knowledge and understanding, the comprehension of the core textbook, essentially, <u>at home</u> in their own time=
R: =Right, okay

T: And then in class, sometimes, you know, sort of starting off lesson by clarifying the knowledge and understanding and then moving swiftly on to the analysis and evaluation and so even where you've got weaker students in the class, you know you can put in the supports through individual talk with…with...with those students…em to support their ability to analyse...em… so… you know…em so...that's a path my teaching has taken, you know I've set up lots of things to support the fact that at home they're doing the comprehension=

R:= What sorts of things?

T: Em, so for now for all my Y12 classes I've got… em comprehension multiple choice tests on Fronter and...which require students to...er closely comprehend em...the...the course textbook in order to pass the test and with these tests they...they… never tell you what the right answer is, you just have to keep going until you've got 100%.

R: Alright, yeah

T: So what...what that means is that…em…students...in theory, students come to the class with a ...with a more accurate understanding of ...of the core knowledge because what I was finding before I'd say to students answer these comprehension questions or make notes on this

textbook and and…you know they were doing it, but doing it in a way which didn't actually get them thinking, more often just regurgitating the book rather than actually thinking it through and so...you know… then they were able to analyse in any depth. Em that's also to my mind a real support to differentiation because you know… a more able student is able to whiz through those questions, do it one time and you know, that's it and so for politics in particular I've got a set of ...em…sort of extension articles which then get them ...which I want them to critique so they're moving up the sort of intellectual skills whereas a less able student they may need to do that test eight…ten times before they've fully grasped it em…but to my mind that's differentitation in action because you know…it allows them to ...to ...you know ...to do that in their own time rather than to have a teacher trying to explain the content in front of a class and expect them all to move along at the same time.

R: Yeah,yeah...so that when they come they are all at the same point, it's taken them longer or less time to get there.

T: Yeah, absolutely

R: Thank you, that's really helpful, thank you, thank you very much

T: No worries.

End of Interview.

Appendix H: M.11.3.13

Lesson Observation 1 Transcript

NB. Names of students have been replaced by randomly assigned letters.

Y13 politics period 4 from 3 &4 double lesson. On entry 14 students sat round 1 large single table seminar style. Students drawing a picture to illustrate their understanding of a Fiscal Conservative. See IWB resource

T: I'm going to give you a clue, ok, it's not…it's not just about money…it's not just about money (34)((Teacher circulates and checks over students' work. students discussing their ideas with neighbour and making notes))
S1: (inaudible) don't believe in a safety net
T: Sorry?
S1:They don't believe in a safety net for society
T: Em ...er...no they don't generally they believe free market sorts things out and…and rather than allowing the government to do things but have a think on how you might represent that ...OK, THIRTY SECONDS, THRITY SECONDS. Excuse me °(28)((Teacher moves to the front, students still working on their illustration -some discussing with partner)).
Right...okay...what are...what are the key words we might use with fiscal conservatives just to get us started, we'll look in more depth in a moment, F?
S2: I was gonna say free markets.
T: Free markets, right…the prominence of free markets, em…Shakira?
S3: Em..capitalist
T: Capitalist, em, Amrita
S4: Smaller government?
T: Small government, yep ((teacher points to another student))
S5: Getting rid of earmarks ...in a limiting sense.
T: Excess government spending, right, yep, S?
S6: Em (.) have we already had less taxes?
T: Yep...as part of...yep...so
S6: Lower taxes
T: Yep so lower government revenue overall, less spending, less taxes. Okay, what I want you guys to do, the same thing you're doing with Social Conservatives a few minutes ago, I want you to clarify their beliefs. This time I'm going to give you slightly less time, ten minutes okay to do it. Can we move back around where we were, okay, ten minutes I want you to clarify what their beliefs are go through the same questions okay, and really get to grips…I…I want you to...to pick up this idea of evidence what idea, what evidence would they pick up on to justify their world view, okay? That...that's one of the keys…keys to everything.((Students move around to work in different pairs/groups))(21)
((Teacher comes over to researcher to provide context))

T: Basically, for this one, for homework they made notes on both Social Conservatives, Fiscal Conservatives and Moderate Conservatives. Em…so it's basically a clarifying lesson about what the different variants of conservatism is. And then on Friday they're going to be assessing which brand of conservatism is dominant in the Republican party em..so...and yeah, it's just really clarifying.

R: Huh hum ((Teacher moves off to circulate around the student groups))
(18)
T:((to one student, looking at her illustration)) What'd be the big fat thing?
S7: (Inaudible)
T: Yeah, explain.
S3: The fact that there's a deficit (inaudible) and they're selfish and they just care about spending money...to balance (inaudible.

T: Yeah…yeah...em...why...? Are they, are they set on balancing the budget?
S3: No
T: No...not necessarily. What...what…what do many a Fiscal Conservative in the Republican party want more than anything else?
S3: Lower taxes
T: Can you explain that, then, H, how...how lower taxes might actually then lead to a balanced budget 'cause surely you'd need to raise taxes to balance the budget?
S8: (Inaudible) to stimulate the (inaudible)
T: Yeah, right, absolutely, and what...what's that commonly known as?
S8 (Inaudible)
T: And what era would they point to and argue that that actually happened?
S8: (inaudible)
T: Not really, a big conservative era before that?
(.)Reagan...reagonomics, okay, maybe just check…check that because that's one of their...to their mind during the Reagan years the budget deficit went up because Reagan was cutting taxes and increasing defence spending and that the economy was booming (unclear) bust again, okay, so ...yeah they…they would argue that that's…that's what they want to recreate (6) ((teacher moves to another pair)).
T: So, what, F, what's informing their world view?
S2: We said that they, basically, (unclear) who should be given decision to make in their best...in their own best interest =
T: = Right, yeah =>
S2: = Because then that way they can make the best decision because (unclear) when government interferes
T: Yeah
S2: Then things go bad such as the deficit
T: Yeah, yeah
S2: And then this can back turn, so if the people are given the choice then they will act in their best interest and [the economy
T: Right] you know how the Social Conservatives say that man is like led by his selfish [desires
S2: Yeah]
T: What would ...em…Fiscal Conservatives say about the status of man?
S9: (Unclear) they think that's a bad thing, they think people should act in their own interests
T: Right, yeah
S9: They think people should act in their own interests and not rely on government telling you how to act.
T: Right, so selfishness can be a good thing
S9: yeah
T: Greed is good. Would that be fair to say?
S9: Emm
S2: To a certain extent…selfishness can lead to a better society
T: Okay…emm....
S2: Because our own interests kind of do (inaudible)
T: But I think what ...what it is...pe…people are...driven by their own interest and they are more rational when they're making their own decisions whereas Social Conservatives said that individuals can be taken off by irrational selfish lies or impulsive desires.
S2: So They both believe in selfishness but two different aspects of it.
T: Well, the ...the…the social conservatives say that ...em... the government can stop people acting selfishly by regulating in a particular way, government can (inaudible)=
S9:= stop selfishness
T: Yeah. Do fiscal conservatives believe that?(.)No
S9: Less government, more personal interest
T: Yeah, they think the government can act itself selfishly and you know haul...take off tax payers' money, okay =
S2: = They think they should only interfere for punishment, enforcing law and foreign affairs and for the deficit=

T:= Yeah for very limited scope of government. Cool. ((Teacher moves off))(10)RIGHT, YOU'VE GOT ABOUT 5 MINUTES, GUYS, 5 MINUTES ((Teacher joins another pair discussing Kyoto protocols)).
S10: 'Cos basically, with the amount of emissions and stuff produced, that's gonna affect our demand for oil.
S11: That's what Romney was [arguing
S10: Sir, I was] reading this article about in 2020 America will be completely self sufficient in oil which basically means that they're gonna=
T: =Because of fracking?
S10: [yeah
T: Yeah, yeah]>
S10: And they said that they're gonna basic... they're not gonna care about the Arabs at all because obviously… the main reason they have all these terms and stuff with the Arabs is for the oil but as soon as they're self-sufficient they're like, you guys can go to hell.>
T: Yeah...yeah
S11: They're...they're the 6th biggest exporter of oil, right?
T: Yeah, already, yeah...so
S10: So in 2020 they will be completely self sufficient.
T: Mmm
S10: So basically it means they don't need any of the Arab countries.
T: And what did that article argue about why that revolution in fracking had happened?
S10: I can't remember, I read it a really long time ago.>
T: Okay, because there is an argument…you know how like …you…you know about fracking
S10: [Yeah
T: a new] technique to get oil out of the ground, that's been led by led pretty much by private companies so Fiscal Conservatives would use that as an example of what free markets economics can do ...yeah...and who interferes with that? Who's stopping them from expanding their oil production even further?
S11: Social Conservatives?
T: No, not social conservatives
S10: the environmentalists
T: The environmentalists...represented through the…?
S10: obviously they have some sort of negotiating (unclear)
T: ((shakes head)) governments, okay, groups like the =
S11: (unclear)
T: yeah..there's whole departments, which is it?
S10: protection ...environmental protection agency
T: yeah...yeah absolutely, ok.
S11: But wouldn't you argue that it would just be that agency that's trying to stop it
T: Mmm
S11: Wouldn't the rest of the government want to be self-sufficient?
T: Partly, yes, so the Pentagon [and the department
S11: [Yeah
T: for Energy]
S11: (unclear) because then they're gonna have to think of ways of protecting the environment without...'cos it's gonna affect us like ...as we can't (unclear)
T: absolutely
S11: So we're gonna have to think of ways like the UK has the congestion charge and that's costing like Londoners millions and millions a year [so
T: because] fracking potentially ruins the land and can destroy the quality of water, so who is interfering with you know=
S11: =Government
T: Government is interfering=
S10: because of government intervention, but if it was down to the government that would never happen
T: Absolutely, yeah...yeah, and there is an argument that is interesting

that it's taken off in America where generally, even though there is EPA it's much less strong than environmental regulators in Europe (unclear) exactly because it is more free market and that's what fiscal conservatives want...more ...more of that.
S10: Yeah, so that would be an argument for
T: yeah
S11: an argument for (unclear..) ((laughing)).
T: ((laughing)) we'll see about that. Right so think about what…what Fiscal Conservatives…and then think about the individual as a decision maker.((Teacher moves off))(14) ((Teacher joins another pair of students))
T: What do you reckon?
S1: (unclear) minimum government intervention on social issues ..like letting the free market…
T: What do they believe about the individual as a decision maker?
S1: That they will make decisions that are beneficial to themselves
T: So in other words...using economics words?
S4: (unclear) the most profitable....profit
T: Profitable...yeah…so our word, the most ...rational, they're rational individuals, rational decision makers. Is that something Social Conservatives believe?
S1: No
T: No, what..=
S4: = It's completely opposite, they think they need to guide=
T: =mmm
S4: So they know what is right and what is wrong
T: Yeah...absolutely, so there...so it is really quite different. What if anything...any other big issues which social conserv...what's the big biggest issue for Fiscal Conservatives at the minute?
S1:Em...protecting gun (ownership)
T: yeah…from government interference again, because who's in the best position to defend their own home, is it the police?
S4: It's the individual.
T: Yeah, individual home owners take that decision, they're in the best place, okay. Em, but what about...what should happen to people on welfare?
S1: (Unclear)so what do they say about (unclear)
S4: ((Talking to S1)) they...they say that (unclear) alternative (unclear) that anyone wanting to receive some sort of benefit they would have to prove that they were in some sort of work and they can't say it's (forever) because they're trying to cut it down.
T: Because if you give individuals welfare, what can happen to [it
S4: become] dependent
T: Absolutely...okay((teacher stands up and moves to screen))(19) RIGHT, OKAY, EM, RIGHT GUYS CAN WE GET BACK AROUND THE TABLE PLEASE (6) Okay em...right...so what is…what is the world view here? What is their perception of the world? What's the...what's the...if we start off with the biggest issues animating fiscal conservatives what is that big issue?
S12:(Deficit)
T: Deficit, A, can you just explain about that?
S12: Em…they think that there's too much wasteful spending and so government should like use money more effectively.
T: And what would they…what precise evidence would they point to for that?
S12: Em ...port barreling?
T: Port barreling…okay, I think also, more than that they would..((points to another student)), S?.
S11: (They'd criticise) other departments and stuff 'cos they're ....like education, EPA and all that stuff it's costing...it's costing the government a lot of money [and
T: Well],let's be…let's be precise on this, what=
S9: =(They hate welfare spending)
T: That's part..that's part of it as well okay that's the negative effect of welfare spending okay, so people become …they're dependent on benefits, okay?
S4: (It's) the beast
T: The beast, right, and what is the beast?

((Several students together)): Big government
T: Big government and right now it's the…(.3) deficit okay. What I'm getting at is we need to have some precise figures for just how large...and I know it's always growing okay...
((Several students suggest different figures at the same time))
T: Sorry?
S8: A trillion... close to a trillion dollar deficit right?
T: A deficit of a budget so it will be overall level of American government debt is…?
S8 & others: About 16 trillion
T: Right ...okay...and who's that owed to mainly?
S8& others: The Chinese
T: Right…yeah …okay so… George Bush is very interesting as a Conservative he was the one who ramped up most of the debt because Clinton spent a lot of time cutting it down okay...but we'll come onto that on Friday's lesson when we analyse what sort of Conservative Bush was, okay. Okay, what...what I'm getting at okay who...who owns most of that debt?
S5: China
T: China. And how does that worry fiscal conservatives?
((Many students start to offer an answer))
T: U, explain.
S1: Because China's economy is like the fastest growing right now and they're afraid that they're going to become more economically and also in other aspects more powerful
T: [Yeah
S1: than] America
T: There's...there's a general worry about the...the...the...relationship between America and China and…and that's reflected in the worries about the deficit, okay. So what...so what underpins this conservative world view, I think it's fair to say they are anti big government, okay, they prefer a small government. What underpins this world view,K?
S3: They think that humans can know how to spend money themselves (unclear) selfishness and stuff.
T: Explain the view about selfishness?
S3: (unclear, very fast) (different to social conservatives) but they think it's a good thing.
T: What's a good thing?
S3: Because if you (unclear) ((two students talking at once) there's more competition and more opportunity.
T: Right so competition between individuals is inherently a good thing, okay
S13: They think you can't go wrong with ...(unclear) they assume people are going to be spending it on what they need …
T: Right, so in other words individuals are…what?
S4: Rational
T: Rational, yep, absolutely …individ… and does that...does that chime…does that agree with the Social Conservative? What do we say about what social conservatives think about…((points to student))
S13: They think man is immoral
T: ((hand gesturing to others to hold on))Just...just one min…T?
S13: They give into desires
T: Yeah, man gives into desires too easily whereas Fiscal Conservatives believe em…actually…individuals are…are rational decision makers so therefore if you offer them er…a you know...a chance to stay on welfare em...as opposed to getting a job, they will stay on welfare. Em so there is a very different worldview at the heart of that okay, any questions about Fiscal Conservatives? Anything we're not sure about, about their world view?(1)Okay so what …so what policies would they recommend if...yes, S
S11: [Tax cuts
S13: balanced budgets]
T: Okay, you're saying balanced budgets ((points to S11))and you're saying tax cuts((points to S13)) and actually you can't...it's very difficult to do both at the same time because if you cut...cut taxes further=

S13: = you have less revenue and less to spend
T: Yeah…George Bush for example cut taxes for the richest in one sense (student contribution inaudible)
T: Absolutely and so the deficit went up massively but…yeah...Fiscal Conservatives do want to …are very worried about the budget deficit as we were saying, so what do they believe...how can you reconcile these two aims?
S3: Deal with that first and then ta...cut taxes afterwards.
T: What? Balance the budget first, then...but surely you're going to have to put taxes up to balance the budget? A?
S14: You want to use money effectively=
S13: =(unclear) because right now I don't know how much makes up ...how wasteful spending has made up the deficit debt... maybe it's significant [amount
T: mmm]and what would they=
S13: = and if you cut back on that they would have more money to…((balancing gesture))to balance it out.
T: Okay, and what would they term as wasteful spending?
S12 (and others): earmarks
T: Earmarks, yes
Several students: welfare, medical programmes that no one really (unclear) cares about
T: Really? That no-one cares about?
S13: Well, they don't care about as they see it as…as … wasteful spending.
T: What remark does this link to in the presidential campaign?
Several students: 47 %
T: Explain, L?
S6: 47% of the country are dependent on welfare which is what Romney says.
T: Not just dependent on welfare but dependent on government hand outs such as...it's not just welfare but it's also (.)?
S?: The tokens that food token thing.
T: Yep, food vouchers, what else? (inaudible students) yeah, also medicare and medicaid okay, you know..... most old people, most senior citizens are dependent on government subsidised healthcare.
S12: (unclear) and if you cut back on these things, medicare for the elderly (unclear)
T: Absolutely, okay. Em...right…okay so let's just, H, can you explain you can both cut tax in the Conservative world view you can both cut taxes and cut the deficit at the same time?
S8: Em...so if you cut taxes some will have more money to spend so they'll spend it in shops ...em generally the economy will grow and that allows the government to collect more taxes as it is, so the budget will kind of be balanced.
T: Mmm..okay and this was=
S12:= (unclear)
T: Okay, yeah,
(unclear student contributions
T: Well, yes, essentially it's a...it's a…
S8: It stimulates the economy
T: Yeah, so…yeah...tax cuts are a form of stimulus which then grows the overall economy so it's possible to repair the budget deficit, okay. That...that seems true to say, so that's the way they reconcile it. Em what do they… we're were having a discussion about environmental regulations, K, can you just say about that?
S10: Basically, I said that...I read an article that in 2020 em…they were saying that America will be totally self sufficient in oil and a lot of that was to do with that...er ...fracking when=
S13: =they dig down
S10: Yeah…and basically a lot of that was done by private companies and firms…and we were talking that how if it was down to the government that wouldn't be done because, because obviously they don't want ...the amount of environmental impact...and a lot of the time the land that's been fracked you can't really, you can't really use it for any other purpose, so the government would have been against it whereas the fact it was down

to the private firms, they did it and now, by 2020, the could potentially be self sufficient which means they don't need any Arab country or anything like that, they can be totally self-sufficient.
T: So...so in America there's already a lot less government regulation of the fracking [industry
Students: yeah]
T: than there is in Europe and it's America which has led the way on fracking to the point that, yeah, it could well be self-sufficient in oil which has massive geo-political effects because then it…it seems fair to say that America will be far less interested in what happens in the Middle East, okay. Em okay, any questions on Fiscal Conservatives, how they would change...how they would change America?(.) Okay, what I want you guys to do is to spend 2 minutes okay, amend your cartoons of fiscal and social conservatives, anything you would add on reflection, anything you would add, anything you would change, okay, 2 minutes((students work on individual cartoons))(1 min 08).
T (to S1) What are you adding on?°
S1: Em...you know the balance thing ((gestures balance)).I want to draw that in.
T: Right, fair enough°((Teacher circulates to check what students are doing))
What would you be adding on, S?
S11: Mmm?
T: What would you be adding on?
S11: Efficiency
T: Efficiency…in what way?
S11: (unclear) and how they pay taxes (unclear).
T: Not necessarily, not necessarily, you might get a Fiscal Conservative and a Social Conservative but you don't...it's not necessary to be both and we'll look
S11: (unclear)
T: Well...then this is…do...do fiscal conservatives believe you can… you can use the power of government to change people's behaviour?
S11: No
T: so even if they are Christian they don't believe you should use the power of government or their assumption might be they doubt the ability of government to change people. So it's not that they're not Christian, it's just that they're more secular in outlook, they don't want to, you know ...or don't believe you can use power of government to change people's moral behaviour. OKAY, EM.. .RIGHT...HOW DID WE CHANGE...HOW DID WE CHANGE OUR CARTOONS EITHER OF OUR SOCIAL OR FISCAL CONSERVATIVES? R, can you=
S13: =I put (unclear) more focus on debt, more focus on tax for rich people.
T: What do you mean 'tax'?
S13: (unclear) tax
T: Right, to stimulate the economy, yep
S13: I put (unclear) on the single person… on individuality
T: Yeah, absolutely, that's at the heart of it, Margaret Thatcher once said, 'there's no such thing as society'((laugh))okay by that...yeah(student comment unclear). Okay...there's...there's an argument that she…she was making that society is made up of individual decision makers, okay. Right, okay, we're going to move onto Moderate Conservatives but we're going to do it in about 2 minutes. Why do you think we're going to do it in about 2 minutes? H?
S8:(unclear)
T: Right…okay…arguably within the Republican Party they're almost extinct okay. What have they been described as by ...by their opponents?
T: Right…right okay ((laughing)) what...what are they...it's an animal you would often find in Africa...with a big horn.
S13: A rhino
T: A rhino, why a rhino?
S13: They're becoming extinct
T: Not just that, okay ((laughing))Em…not because they're big...what does...okay...it's an acronym of R-I-N-O, have you heard of this?

S13: Republican in name only
T: Right, thank you, republican in name only.
((students laughing and congratulating student with answer)).
T: Yeah, formerly, there used to be a big section of the Republican party you might describe as Liberal Republic...Liberal Republicans or Moderate Conservatives or paternalistic conservatives. What would you...I just want you to talk through in pairs what di...did they believe, I'm using the past tense here. What did they believe, okay? Talk to about it in pairs, take 2 minutes. (1 min 10) OKAY ...ALRIGHT...How do moderate...how do moderate conservatives differ then from social or fiscal conservatives?
S3: They disagree with what both of them think
T: In what ways?
S3: Like...they don't like them telling gay people and abortion people what to do and then they don't...like...er welfare either...they don't like them attacking people on welfare so (unclear)
T: Right ...exp...okay ...em…so…so right so they...they dislike the divisiveness and the harsh language used to describe… em… certain minorities, okay, whether it is women who have once sought an abortion or gay people, for example. H, can you explain?
S8: I think that David Cameron supported gay marriage, he hasn't really done anything for abortion, but he can still describe himself as conservative and that might annoy social conservatives and fiscal conservatives because they're just not conservative enough.
T: Okay, how does David Cameron justify his support for gay marriage as a Conservative?
S8: He supports marriage in general but he believes that gay people should be allowed to ...(unclear).
T: Right, that is an example of moderate conservatism in the American context, someone who...you know...takes say...who says look marriage is a traditional value which I want to support and use government to support em...but I want it to be available to everyone. So, he's kind of updating some of the values okay and =
S1: = and maybe that's what's wrong with Republicans today that=
T: =What's that?
S1: That they're too extreme one way and another and...even in the future people say they have no chance in the future because ...unless there's major change.
T: Yeah...absolutely so...yeah...I think...I think ...and this is the critique of the Republican party that we're look at on Friday, okay, because it is …you know...there is an argument that Republicans can't win election until they actually solve this problem about how to actually appeal to people, okay?((Students making independent notes)). Em What about fisc...how are they different from Fiscal Conservatives?
S13: (unclear) ...intervention because there are people less fortunate that can't really exercise that individualism that other people can
T: Yeah
S12: So other people need support in order to reach (unclear)
T: Yeah…so although it's preferable to have minimal government for some…for some people the state is a ... is a guarantor of their safety and security…Sami?((student indicates wanting to contribute)).
S11: ...(unclear) a safety net for people so on an individual basis...if someone like really can't do anything about it…((unclear)) their situation, unemployed or ((unclear)) ...whatever, then they can fall back on something which will help them in the future to go back into employment.
T: Yeah...absolutely...so that may be a temporary support, okay, it's not there…it's not a lifestyle for them to live on, okay, but it's there for certain points in time, okay? I…I said that em...I said that em Moderate Conservatism was dead but you know in the book it says about John McCain em becoming the presidential nominee in 2008…you know, and we might extend that with Mick Romney, you know, he was surely a quite Moderate Conservative...in 2012?
S1: No but (teacher turns to student) (unclear) from primaries to general

election
T: Right, okay, so... (other students offering comments)
S12: (unclear comment)((teacher points to him))
T: Yeah…right
S1: Yeah because the primaries are actually more extreme...the general election you're trying to appeal to the whole of America so you have to be more moderate.
T: Absolutely, the same thing happened with John McCain, okay, so although you have, okay, ostensibly moderate candidates (.)((students writing notes)) they have to tack to the right during what?
Students:((collectively)) primaries.
T: Primaries, okay, to appeal to the party base, okay. And then it's very difficult to flip-flop again, okay, and bring yourself truly back to the centre.
S1: That's what people say about Romney, isn't it?
T: [Yeah
S1: That he kept] changing and changing his mind ((hands moving side to side))
S13: Yeah… that he went to the other end and [then back again
T: and back again]. Yeah, an...and actually in fact he generally...to be fair to him he did stick to his more conservative positions that he had adopted during the campaign, he tried to moderate his tone, but generally the positions were still quite horrib…well…were…were quite conservative like for example you know from ...em you know launching a healthcare scheme for his own state he now said oh no, not actually, no on a federal level that's a really bad thing etcetera.
S13: (unclear comment)
T: Yeah...exactly. Right, what I want you guys to do now…I'm gonna …em…I want you for homework, okay, you can get started on this now, I want you to devise a qui...em ...devise... em a survey that would help detect whether someone was a Social Conservative, a Fiscal Conservative or a Moderate Conservative. Yeah, ((points to student))B, yeah, a bit like, yeah magazines...yeah ((students laughing))a bit like those inane questions about things, okay, this has a more academic purpose, okay. Em...right...I just want you to brainstorm what sort of issues...what sort of issues could you think about for this, and then I'll give you an example of how you might want to word your questions, okay?
((students discuss amongst themselves)) (8.1)
S7:(to another S): Do you like the free market?
T: What…but...but that's the ...that's the thing...we want a more...okay...th...the... yeah, your attitude to the free market is one of the issues that you might want to pick up on but your question is going to have to be much more...er precise to draw out the differences, okay? So just brainstorm the areas ...the areas you might want to pick up on, okay?
((Students discuss together. Teacher circulates round the table))(1 min 04.3)
S11: Would you say (attitudes) to privatisation?
T: Er... well...but, also there's a question mark about privatisation for the scope of government so I think you're going to need to...to develop a more ...a more probing question. But just think about what areas you would want to question on, okay. I'll give you an example of a [format
S11: Oil?] The oil industry?
T: Ye:ah, you could…well, okay, so you could talk about=
S11: =it's a big question in the USA now 'cos like they say you should …should the land be privately owned (.) or should it stay with government and let the firms drill (unclear)?
T: Yeah…true...okay, but you're going to have to pick up an issue where Social Conservatives are likely...might have a different view on, okay?
S11: Right..I understand...so you want to link it back to social...
T: Yeah, so...so ... for all three, so something that Moderate, Social and Fiscal Conservatives all have a different stance on.
S10: Sir, do you think society has a (unclear)?
T:Em... don't worry about the precise wording for now, okay, just think of

all the different areas you could focus on.
S3: So could you ask if you're religious?
T: Em.. you might ask something...yeah...about the attitudes…how far attitudes to religion might inform…er...government policy.
S3: So…do you follow the bible..?
T: Well, we'll think about the precise wording but just generate as many areas as you can, okay? ((students continue discussing. Teacher returns to front and sets up computer)) (32)
T:RIGHT, OKAY, so what areas could we look at...em...okay U, can you start us off?
S1: I don't know…like…it's hard not to be too obvious, like...em...you can ask stuff like ...em... would you be in favour of gun control...something like that.
T: Okay, right, okay. M?
S4:Em... do you agree with increased government spending or like=
T: =Yeah
S4: How the government are spending their money
T: Yeah, okay, so the role and purpose of government spending, perhaps, okay we might want to jot some of these down if we don't have ...don't have these, H?
S8: Mine was similar, should employment...should unemployment benefits be cut?
T: Yep, okay, em...K?
S3:I put...em...roles of schools and parents
T: Yeah..okay..em..yeah I think definitely...J?
S14: Looking at key areas like abortion, sexuality, taxes (unclear)
((Students collectively respond to this suggestion...laughing))
T: so you've picked out a whole range, yeah(student comments inaudible)
S14: you could mention (unclear) massacre and the (unclear) massacre…indirectly.
T: Yeah, okay ...(students respond -inaudible)
T: okay...any not mentioned by J?...V, go on
S5: How do you feel about the welfare system?
T: Yeah, absolutely, so attitude towards the...the…again...the role and purpose of social security, okay. Yep, T?
S13: What do you think school vouchers should be used for because social and fiscal use it for different purposes
T: Right, absolutely, that...that's a good one so it starts to differentiate between Social and Fiscal Conservatives which I think is going to be the difficult aspect.
S10: What do fiscal use them for?
S12: Fiscal use them for ...the ability for parents to send [them
S3: for crap schools
S4: to have control]
T: The Fiscal Conservatives believe it's better because em...
S13: (unclear)(S13 addressing S3) Conservatives that you can spend money how you want and you know the thing about the free market idea...you can spend it into sending your children to a private cath...Christian school with Christian values and traditions.
T: Because, remember, the government can't establish Christian schools, it's…it's not allowed to under the Constitution, okay? Right let me give you an example of the wording of this, okay. So, this is a question about gay marriage(4.2) ((teacher moves to computer))Right okay, that'll just take a moment, so (0.8) so…so the question I'll ask is 'which statement best summarises your attitude towards gay marriage?' and I said: A- this a matter for the states alone, the federal government should not interfere either way; B- marriage is the bedrock of scoiety and as such should be open to all whether straight or gay; C- marriage is a Christian institution and can only ever be between a man and a woman. Which is the moderate, which is the social em… which is the fiscal, okay, discuss.
((students discuss answers)) (22.7)
T: YEP..WELL..WHAT DO WE THINK? K, can...can you explain?
S3: Emm
T: sshh...sshh

S3: A was fiscal? C was moderate and B was social
T: Yeah…why...why is A fiscal?
S3: Because it was [(unclear)
S8: because they prefer small government]
T: Yeah..and…yeah...well, small...limiting the scope of a... federal governments because states have =
S13: = their own rights
T: Yeah, their own rights which...which should be protected, okay. B is moderate because …? ((students reply collectively))
T: L?
S6: It gives you a choice like whether or not you want to be gay...like ((laughter))...it doesn't restrict you
T: Yeah…but it's also doing something else
S6: it's establishing marriage...it doesn't matter what marriage is defined as, it's just a unison between two people.
T: Ye:ah, so it's taking the traditional value be it opening it to all, whereas C is, A?
S4: Traditional...it takes like a kind of religious (view)
T: Yeah…yeah..it's informed by what they would see as traditional religious values. Okay, the homework, I'm going to put this example up on Fronter. I'm going to ask that you contribute your questions, okay, as forum items, okay, and from that, just a moment before we pack away, and from that, you construct ...you pick and chose other people's questions, you might want to reformulate I'll put precise examples up on Fronter. Okay, so in lieu of the lesson on Wednesday, 'cos target setting day, what I want you guys to do is actually go round and survey some people, okay, to find out well you know…are they...are they...are they conservative at all, okay, if so, what...what sort of conservatism would they tend towards. Okay so check Fronter later for details, please.
(Students start to leave)AND CAN WE PUT THE TABLES BACK, PLEASE, AS THEY SHOULD BE
(End of recording)

Appendix I: M 26.4.13

Lesson Observation 2 Transcript

T: Ok guys, we're gonna start off by looking through your..er..em 15 markers on lobbyists ok, so if you just get those out then we're gonna em...look through...em Z's, Z has em kindly volunteered his work (.) em and so ...em just just like we've done before ...em what I want you to do is just to…em… evaluate it...ok? So add your comments onto Tanzil's and then we'll discuss in a few moments we'll see what...what lessons you can learn from Z's what you can apply to…to your own work, Ok? Em…ok let me pass this around ((teacher hands out copies)) take one and pass them on please (4.0). Ok, so have we all got a copy?
S1: No
T: No? >Take one pass one on<(3.0.) °Ok thank you. >ok so have a look through< Ok...annotate (2.0) Think about the...er precision of Z's examples because we said that was…er the, the key thing when we're looking at ...em ...er pressure groups ok, you've got to be precise in the examples that... that you give, ok? You can't just say that so and so donated money so therefore it had an impact, you've got to explain how that money has an impact, what does that money do? How does it translate into political action?((Students left to work on the piece individually)) (34). ((Student enters late)).
T: ° We're just reviewing T's work(14.7)((teacher sets up materials on IWB))
T: S, could you just close the door, please ((students continue working individually on their feedback. teacher seats at front also annotating the piece))(1 min 44)(Student arrives late T passes paper to S) (4.0) Ok guys, just take 30 seconds, ok, so have some comments, things you want to question T on. (28)
T: Okay, let's…let's talk through this, ok, em who wants to start off? What...what were the positives here? What did we think Z did…did very well, bearing in mind this is the AO1 mark so it's knowledge and understanding that…that we're really looking for here? Em…H, can you start things off?
S1: Er…he has some really good examples that...that (inaudible) maybe the third reason is a little bit...er...I couldn't say (weak) but he could probably have out an example in [there =
T: = right, ok so certainly there are two precise examples ok so both Liz Fowler and Jack Abramoff, ok? Em what else...what else did we think was positive here, U?
S2: I think the introduction it answered the question and it gave what I thought like a brief analysis of it.
T: Yes, yes it gives a direction, it ...it does what the introduction to these 15 mark questions should do which is to give a steer, ok, give the reader an understanding of what your...what your judgement is on this particular question,> ok. Anything else? What else is...is…is positive here? J?
S3: The example used for em…the Jack Abramoff (inaudible) actually given (inaudible)...why...why it makes...makes the politics so dirty
T: [Yeah
S3: = (inaudible)]
T: Yeah
S3: So that was [one way it…
T: Absolutely]so…so it links it back to this idea of contr...being controversial and that's the key...the key word in the ...in the title…Em right...what do we think ? Well...any...any other positives? Any other positives just to pick out?(.)
S4: He's made it pretty clear that he understands [a...inaudible
S5: inaudible… full range of] points, yeah, there're not all...like...really similar, like he's got one on the revolving door system, the other one is...er the money…he's got a range of [points
T: yeah]
S5: which does show that he does understand why it is controversial.
T: Yeah, absolutely, ok so there is a good range ok...and...and having

three points for a 15 marker, that's the sort of technique you should...three development points...that's the sort of technique you should be aiming for . What about ways to improve? Em…er, A, what did you think?
S6: Em, for the first point I thought he could have …em made things link to policy making like more explicit.
T: Explain.
S6: Because he spoke about revolving doors ... he could have said …and linked that back like by saying there's ...er concept er constant access to power.
T: Yeah ...wha...what do you mean by constant access to power?
S6: Em…
T: In this particular example with Liz Fowler
S6: (.5)
S3: Because I would say that she left politics in a way that she still maintained her influence [after
T: yeah]
S5: She was there she kept her foot in the [door
S3: yeah]
T: Well she's done this a number of times hasn't she because she was…em...what...before she wrote healthcare legislation what...what was her position?
S6: Vice president
T: Of? ((several talking at once, teacher points to S8))
S8: Wellpoint
T: Wellpoint, the biggest health insurance company in America and then she wrote the legislation=
S5: =to send more business their way essentially
T: Yeah to require every single Amercian to have publ...to have health insurance↑((several students talking at once))
T: Yeah…she...she=
S5: = She got herself more business and [then
T: yeah] and always the suspicion is has she just switched...has she just got this position with Max Baucus because she's publicly minded?
Several students: No!
T: No, it would seem unlikely, ok…em it would seem that...that...that what she is doing is extending her influence beyond her ...em…you know…her job at Wellpoint bearing in mind that there is this constant revolving door and she will go back into private industry and make a lot of money for it ((teacher making a revolving gesture with hands. students making notes on what the teacher is saying))(.) So if you like, she's a…plant (.5) of a health insurance industry [that
S9 (inaudible short comment)]
T: Is there any...as we discussed on Wednesday, could this happen in Britain?
Several students: No
T: Who…who writes legislation in Britain?
Several students: Civil servants.
T: Civil servants, ok, unless it's a private member's bill, ok, so there is a difference here, so this is a…this is surely a major access point for lobbyists it's...yeah, it's pretty massive, ok? ((Students continue to make notes)).Yeah, so…er...A, on your point, I agree, I think that link could have been that…that bit more explicit. So...how...and also, I mean (.hhhh) is it positive to have (.) em...this this...em technical ability to write legislation ...is it positive to have it in the hands of lobbyists or professional lobbyists?
S3: It's surprising em…they don't, they don't care for the majority …they only care for their income or like for whoever they work for they've given the power to the hands of the elite, kind of
T: [Yeah ((nodding))
S3: that] [argument
T: So it links] back to this idea this is how corporations em… can em…unduly influence em…political decision making
((S10 puts his hand up))Ok, S?

S10: I'm not sure if you can do this in a 15 marker but can you relate it to the concepts…er democracy...
T: Yeah...which...which...which one would you link it back to?
S10: Pluralism
T: Pluralism, so this...this is an example of pluralism in action, of having…there are multiple action points here, em…but at cost of what?
S3:Democracy
T: Explain
S3: Because of all this corruption, money is influencing members of Congress' decision, so ...they're not representing the people.
T: Yeah [pointing to student]ok…yeah...H, what did you say?
S1: They're exercising unaccountable power
T: Who, the lobbyists are, on behalf of the corporations?
S3:(inaudible) 90% republican support of gun control…and they still refused it…because of the …NRA ((other students nodding)).
T: Yeah, we'll focus on that in particular in the second half of the lesson when we look at the Senate, ok. Just on that point about...em ...unaccountable power, what would Conservatives in America say about this? ...Because we've been coming at this from quite a Liberal perspective so far ((S10's hand up))
S9: It's part of democracy
T: In what way?
S9: Because it's allowing a form of participation because you can't have democracy without the participation of everyone...because democracy is the ability to have a say in the system.
T: Yeah
S9: So they would argue that this is a way for a collective group ...of collective thinking to have their...say.>
T: Ok, yeah, yeah…that would be a starting point, S?
S10: So they would argue…((pen drops unclear))freedom of speech, so they could use their money to influence what happens in congress
T: So ...so it's just a natural consequence of...of free speech and Citizens United versus FEC reaffirm that corporations have free speech rights.
S5: Can't you argue that there is accountability because of regulations (unclear)?
T: Yeah…yeah↑ that...that is yeah...that is a good argument because essentially it's these corporations that are going to be most directly affected by the laws and so ...you know ...you could argue that it's a good thing that they get to shape these laws em…because there's a tradition...there's a free market tradition in America em...which has emphasised that government should be a bit more hands off when it comes to regulating companies, so if regulation is necessary the argument is that it's healthy to have the companies concerned influencing that...that regulation…so that it doesn't kill off the health insurance industry, for example ((students making notes)). So, there is another perspective to it, and when we ...em we come onto to do the synoptic essay where we ...er look at you know, sort of, this elitist point of view versus em…er a pluralist point of view, we'll start to really weigh up those arguments. Em, if I just take this back to em…Z's introduction, em...is this…elitist idea…what…what do we think about the way in which Z has written this? April, what do you think?
S11: Em (1.1) he doesn't really say (.5) how (.5) elitists keep their influence
T: Mmm...ok…yeah...it's...it doesn't quite nail it, ok,... there's ...it's not as, to my mind, it's not quite precise enough…em expressing this elitist idea em...because what you say here, "this is obviously been seen as a bad thing by many people as they argue it has created a way for elitist ideology to be exercised" (.hhh) Are we actually talking about an elitist ideology as such?((Several students talking at once -teacher points at S4)).
S4: (Unclear)..you wouldn't have someone who isn't wealthy who is exercising the power of a lobbyist

T: Absolutely, so lobbyists ...you know...they could represent...a whole range of corpora…er...er of interests but typically they work for ?
Several students: The wealthy
T: The wealthiest people as they have the most money to spend on...on…lobbyists ok, and so what we're talking about when we're talking about the elitist perspective is this idea that the…the elite can buy American politics, and one of the chief ways of doing that is about money, ok (.5) so when we're then talking about why the impact of professional lobbyists on policy making in the USA has been controversial, what other statistics can we bring in?
S3: (unclear) affordable health care (unclear) the 2:1 ratio between lobbyists and congressmen.
T: Yeah, that's a really good example to show just how…and how much money flooded into the lobbying battle?((Several students mumble. T points to S1)) How much?
S1: I think it may have been 3.3
T: 3.3? Ok that's something just to check to...to ((several students speak)) Ok, pretty overwhelming... what I was also thinking, remember, in the last unit we...er…hat was…what was Congress' approval rating last year? ((several students talk)).
S9: (unclear) it went down at the end of last year
T: Right, ok, em...
S9:13%?
T: Ok 13% that's pretty shoc...that's the approval rating of Congress, that's pretty shocking, ok. How can we link that to this?((Students talking at once))Ok, there's a …ok, well there's a [perception
Students: yeah]
T: that happens=
Several students: =with gun control
T: Yeah, ok
S2: With 90% of Americans for gun control
T: Right, so on the background checks in the Senate, so, so we see that...that yeah, it...it is one of the reasons why Congress is held in such low esteem.
S4: Sir, I was watching the (unclear) video and it was saying that 56% of NRA members supported background checks as well
T: Mmm, the NRA itself used to support background checks
S5: It was saying how it's gone from partly a protecting gun rights to kind of em… almost giving ...em gun rights in the hands of criminals and those with=
S4: =money
T: Yeah
S9: Because of protecting big business and [gunmen…
S5: They're listening to] them rather than the actual individuals
T: And that's another argument that we'll look at when we evaluate the pressure group activity on the whole, whether pressure groups are accountable in themselves to their own members or whether actually money...the donations they get from big corporations actually corrupt inside pressure groups too, ok? Em, just to remind ourselves, why are…why is…the act...why are the activities of professional lobbyists perhaps more significant in the House than the Senate?
S5: (Inaudible)every 2 years… elections
T: Yeah…so you need...as…as…a representative you need to be on a constant cash gathering cycle, ok for…cos you know you will always have an election within 2 years.
S9: So should I add that to the last bit?
T:[Yeah
S9:So I can] just expand that…that point
T: Yeah, absolutely, I think... I think that...that would be worth doing just to link it in to this idea of money buying...buying politics,> ok? (2.8) ((Students making own notes)).
S4: You don't need to ...to give any points about the other side of the argument, do you?

T: No:o, no
S4: If it was 'to what extent' then you would, wouldn't you?
T: Yeah, absolutely, I mean, that's, that's why...
S9: We had those questions…(unclear)
T: This is, it's not that this is one sided it's just that what...what we're saying here is we're giving reasons why…why it has…so...so...so ..you know sort of what you can do throughout this is evaluate the significance of the points and say 'first and foremost the main reason why…,ok, and then you…you ...you arrange your three or points in descending order of...of significance, ok? (.) Right, any questions on that? (1.4) Ok, I'm just gonna give you guys three minutes just to look over your own work ok, and make any sort of adaptations before you rewrite it tonight, so add in any points, ok any learning points from …from this review.(3 mins.17)

((students work on own scripts - exchange ideas with each other. teacher collects articles from back of room and sorts theseout at the front.))

T: Ok, you just have one minute to add on any extra points ((students still discussing))(45)Let's just add on points for the last 30 seconds. ((T sets up material on IWB)) (13). Ok, let's put that one to one side ok so...over the weekend if you can rewrite that one ok, and then I'll take those in on Monday. We're going to look at the Senate now and we're going to look at how pressure groups influence the Senate. Ok, what's the big example everyone is talking about at the moment that you guys mentioned already?
Students: NRA
T: The NRA, ok, and what's the argument about the NRA here?
S9: That they are just protecting the interests of the gun manufacturers rather [than
S6: the] owners
S9: What (unclear) the supporters
S1: Rather than the view (unclear) of the population.
T: Let me just...just say the vast majority of the population were...favoured the background checks ok, so what did the Senate do?((Students talk at once. Teacher points to S1)). Explain that…that idea 'tyranny of the minority'.
S1: The views of the majority ...(unclear) by the minority
T: Ok, so why is this happening? Why can a minority out there, you know, the NRA and its most fervent supporters, even a lot of NRA supporters and members, as we were saying, actually support background checks, why…why does the Senate allow them to do this? And we…we increasingly see these, that it's the senate that's the issue, K?
S8: (unclear) the filibuster problem and then like NRA pay most of the (unclear) as well
T: Right, that's…that's what I want you to start on, ok, is take...em some post-it notes ok, just take a wodge and just pass them up. I want you to put...do this in pairs and we'll just have a three at the back, ok. I want you to name as many access points into the Senate as you can, so any access point...where pressure groups can access the Senate, ok? So, one access point per post-it. Do it in pairs, so you're generating ideas together
((Students work in pairs -teacher checks computer))(2mins.43)

T: Ok, what ideas have you got, then? what ideas, S, can you start us off.
S10: For example...er filibusters
T: Filibusters ((teacher notes down answers given)) yep
S10: Basically lobbyists ...what they try to do is influence especially the opposition party
T: Ok, if we just stick to the access point at the moment, why is the filibuster such a great access point?
several students: (unclear) because you just need one person

T: Is it...wait...wait a minute...is it just one person you really need?
S9: One person can just keep talking and talking
T: Well...but, is that…is that really how most filibusters happen?
S8: No, they get like a group
T: So…so what's the blocking minority?
S9: 40
T: 40↓Yeah, so you just need 40 senators. Does …em...does a party often have 60 ...er 60 senators a filibuster-proof majority?
Several students: No
T: When was the last time they did?
S8: 2009
T: 2009. Who died?
Students: Ted Kennedy
T: Ted Kennedy. Wait, in fact that was 2010, I think
Several Students: is it?
T: Yes, indeed, 2009, I think, quite. That was Ted Kennedy who died and that broke the ...em... the filibuster-proof majority. Em…has any party had one since?
Students: No
T: Are they likely to?
Students: No
T: No, because of their …how finely balanced it is, ok, so it…it is a great way of stopping legislation going through, ok? Right, what other access points em…Fahd
S12: Em we said foreign policy interests ...em
T: Give me one example of a foreign...er influence over foreign policy
S12: Em...the one of the treaty
T: Yep
S12:(The kind of changing the oil?)
T: Right, ok, so...so...so the ...the access point is the fact that ...em...the Senate has to ratify treaties and it has to ratify it by?
Students: 2/3
T: 2/3 majority, ok. Em…so again, you need an overwhelming majority to pass through a treaty so if you have a ...er a determined minority of senators, they might block that treaty 9.) ok?
S9: (Clinton?) took it to the Senate, didn't he?
S6: No
T: Which…which one?
S9 (among others): Clinton
T: Ok, so President Clinton, no he didn't
S9: [he knew
S6:he wouldn't]
T: yeah....yeah...there would have been no point ...and have there been any climate change treaties passed through since? No, ok…and that might give you an idea of the power of the people like the Koch brothers, for example ok. Right, we've got filibusters, we've got treaties, what else em…er...U?
S2: Approving appointments
T: Yes, as one we had ...we had one example for homework, ok with Chuck Hagel and…who...who...well no, we'll go onto that later. Yep, appointments ↑Why is that important? Why [is?
S1: isn't] that the prerogative of the President to appoint his own cabinet members
T: Yeah so…so it's a way of…it's a way of interfering with the President's control over his own executive, ok, because if a president can't install the person who he wants because he's blocked by em...er a pressure group acting through the Senate that is quite a weakening of the president's power over the executive branch
S2: That's with the judicial [too
T: Yes], explain
S2: 'Cos that's also the president's role and the Senate's role to approve((students talk at the same time))
T: Yeah…and...and we know ...we know just what a pivotal role the Supreme Court has em...and so a point where there are only 9 justices ok

each...each appointment is fiercely fought over. Ok, em...and let's be more precise, when there's an appointment what...what is held in the Senate?
Students: Hearings
T: Hearings,ok.Yeah, and so ...so you're not...so you have hearings, ok, you have committee votes, you have a vote on the whole (unclear?)Lots of opportunities ok for people angry about something to...to ...to...em…to stop something from happening.
Any other...em.. access points for the Senate?
S8: Their staff as well
T: Yeah, they have an extensive staff, explain that idea.
S8: Because it's hard to contact senators because they're busy so if you influence their staff so they can talk to them
T: Yeah, yeah absolutely, ok, so...so making those contacts is really important. Anything else?
S4: Elections
T: Elections, explain
S4: Because you could argue that obviously because they stand for election every 6 years they…they won't be that pressured by pressure groups but they still do need the money at the end of the day. Obviously pressure groups can provide that money and the backing and support in...like,in exchange for their support in certain [unclear
T Yeah, is it]just about campaign funding?
S2: Endorsements
T: Endorsements↑ So there's a number of things, so when we say about election ok we really mean a few things, we mean about contributions to campaign funds, what else?
S9: Support, trying to get support yeah right...in terms of local support
T: Right, turning out the vote ok, turning out the vote on the ground, ok, helping people physically getting to the polling stations. Ok, it maybe registering voters. Ok,what else?
S9: Like media coverage ...like advertise with the local media
T: Yep, ok. Anything else?(.5) What did we say about the NRA ...what was the NRA doing?
S1: Grading
T: sorry?
S1: Grading of candidates
T: Grading, yeah, report cards which are sent out to members of the NRA, so if you live in a state where …with a heavy NRA presence ok, and you know that a report card on your legislative agenda is going to be sent out you might think twice about things. Ok…but it's not just the NRA who do that...a whole range of pressure groups do that, ok. Any final access points into the Senate? (1.2) We've got legislation in terms of filibusters, treaties, em…appointments , anything else we can talk about?
S2: We can talk about committees
T: Explain
S2 (Unclear) and they can change the direction of a bill and stuff
T: Yeah, and that's very similar to the House but it is a point worth adding, ok, yeah, we know there are extensive committees and sub committees and that's where a lot of the action happens on the bills. Remember there's just 100 Senators ok, but they don't get all involved on equal measure on each...em bill, they leave it to the committees to specialise so some senators will have a disproportionate influence, not least...em not least the chair of the relevant committee. It's no coincidence that Max Baucus who Liz fowler got a job with was the chair of the Senate finance committee, ok. Right, any questions on any of those? (.9) Right, what I want you to do very briefly in pairs, what would you say is the most significant one, can you put them in some sort of order? Put them in some sort of order of priority.

((students discuss in pairs. teacher circulates))(1 min.30)

T: ((approaches a pair)). Are you sure about that?
S1: these you can like affect every day ...these ...not so much

T: Ok (10) OK GUYS IM JUST GOING TO SWAP YOU..SWAP YOU ROUND A BIT IN FACT CAN WE GO ROUND THIS WAY ((teacher reorganises pairs)). What I want you to do in your new pairings is, the person who stayed, you're going to explain your ranking of the most important access point and the person who's just moved, I want you to...to challenge ok, to challenge, ok. You've got three minutes ((students discuss, teacher circulates: listens to S10's explanation)).
T: But ultimately the...the senator has to make a decision for themselves
S10: But they have to consult
T: They might get ...they might get influenced by the staff
S10: But I don't think that's less than that ((points to post-its)).
T: I'm not...I'm not convinced ...I'm not convinced that that's a separate access point in its own right but...but I'll let you guys debate that.
S10: Maybe the filibuster
S3: I think the filibuster (unclear as teacher moves away)
(8.0)
T: Ok, are we coming to a consensus about it? What…what do we think is the most important? What...what...L, what's the top of your list?
S5: Filibusters and committees
T: Ok can you explain why?
S5: Basically we said filibuster because essentially you can…right...it...sort of background checks... a bill can be killed even if has the majority support of the [cabinet
T: yeah]
S5: And that was through the NRA having control of the senators and telling them to block it
T: Right, ok
S5: And the committees because essentially the committee chairmans and stuff can decide...can pick and choose what goes forward [to..
T: Ok] but this idea↑ that the NRA could em…could...could tell senators what to do
S5: Not tell
T: How↑...how do they do that? How do they have such purchase on them? Think about that ((teacher moves to another pair)).
S2: Re-elections at the top
T: Right, ok, so you've got elections at the top, explain
S9: because if you…if the pressure groups are advocating a certain person during elections, spending money [creating
S2: they've got a special] candidate already
S9: But they've already got this idea that this candidate once in the Senate will obviously support us so they've already put that into them…doing the elections
T: Yeah…OK. WHAT I WANT YOU GUYS TO DO NOW IS...BECAUSE I THINK WHAT, WHAT WE'RE CONFUSING SLIGHTLY IS THE 'HOW' AND 'WHY' OF THIS, OK. SO MAKE A NOTE OF THIS QUESTION, this question you're going to wrote up tonight for your homework how and why do pressure groups attempt to influence the Senate ...how and why do pressure groups attempt to influence the Senate (2.4) what I want you to do is to reorganise your post-it notes. Which points do you have which relate to the 'how' and which refer to the 'why'? ((Students discuss in pairs))
T: ((to S1 + S4))I'm not...I'm not convinced by that ...maybe just talk through what the difference is between the how and why ((teacher circulating))
T:(to S9+ S2)Are you sure about that? We're talking about ...the question is how...so...how might pressure groups attempt to influence the Senate?
S9:(Unclear)
T: Sorry? The methods they use to access the senator but so…then what's the why then? So what is it about the Senate...why do they chose the Senate? So…give that a go, there.((T circulates))
T: (to S8 + S3} what are we getting to? Is that a how or why?
S8: [it's both
S3: that's what we're not sure]…it's why
T: Is it, why?(7) But why would you want to access the Senate? ((pair discusses)).

T: ((moves onto another pair)) I'm not conviced by that ...what we're looking at is what is special about the Senate…why…why would you go through the Senate to do this?
S4: To affect legislation
T: Yeah, exactly, so that's a why ((teacher moves off)).
S1: Filibusters is a how- that's a method used
T: RIGHT, OK, LET'S ...LET'S ...let's talk through this em...because…it is...it's not...as simple as it looks. Give me some examples of whys, what whys have we got? Em..yeah?
S9: Senate's easier to have influence in...relatively because there's only 2 senators from every state
T: Ok?
S9 So if you've got ...so if there's 2 and there's only 100 senators altogether whereas the House of Representatives is 435 and you may not be able to get that proportion of influence
T: but surely...but surely then there's also hundreds if not thousands of other pressure groups chasing those two senators from each state as well? So, I agr..you are onto something about the Senate but I'm not sure if that directly explains it (0.5) So, what is it, can someone give me an example of why target the Senate
S3: The filibuster
T: The filibuster, explain
S3: Because you…you can try to influence the senator's staff and the senators if there's a need for a filibuster to be...because it's a cause…that's why you (unclear) the Senate unlike the house of Representatives
T: Ye:ah, if you want to stop legislation you target the Senate ok, because we know that they have a greater power to stop legislation
S4: And they rarely have a filibuster proof majority as well so it's effective
T: Absolutely, ok
S2: So is that a how as well?
T: ((shakes head))
S3: It's not a how
T: Explain why it's not a how
S3: Because ...because...the how is like ((gestures to partner))
S8: The senators
S3: Yeah
T: How you get senators on side
S3: Yeah....why is the reason for it
T: Yeah
S3: It's not...it's the result.. of gaining the senators on your side
T: Yeah, absolutely. Can someone give me an example of a how then?
S3: Senate staff
T: Yeah -senate staff, yeah senate staff that's a good example of a how because the access points would be you would work through the senator's chief of staff ok, and other campaign staff, you might take them out to dinner, you might charm them over the phone, you might arrange a meeting . You know how Seema Malholtra was in earlier observing the Antony Nolan Trust. I didn't realise, she told me afterwards that today she is putting forward a private member's bill em…to make education about being a donor compulsory for all 16-18 year olds (end of recording).

Appendix J: M 13.5.13

Lesson observation 3 transcript

((Teacher and students organising room into seminar style layout))

T: Right guys, shall we get our notes out please on em… race relations ((students arriving and sorting themselves out, chatting, Teacher setting up IWB resource)) (1 min 02.5) Right guys, when this comes up I want you to have a look em…at...this...this clip and I want you to tell me what...what sort of perspective is this…this from, who ...who would disagree with this and why? What sort of perspective is it from? Who would disagree with this and why?
((plays satirical cartoon clip on gun laws-race relations))(3 min 15.4)
T: Ok, just take 2 minutes to talk through in pairs, what perspective is it from? Who would disagree? Why?
((Discussion in pairs))(30.6)
T: ((To a student looking in textbook)) you won't find the answers in your books, ok, talk...talk through it, talk through it ((Students discuss in pairs))(42.0)
T: Ok, let…let...let's talk through, let's talk through em…F, can you start us off, whose...whose perspective do you think that was from?
S1: Liberal
T: Liberal, why?
S1: Because they're showing the black people as ...against...the black people's rights, the minority's rights, so they're trying to protect the minority's rights by saying they didn't have them and the NRA are taking them away from them.
T: Right, ok...em...so both the NRA and the Klu Klux Klan were taking away the rights of African Americans, ok…em...why↑ why ↑why do Liberals tend to emphasise that, the role of white people in taking away the rights of minorities?
S1: There's the (wealth)=
S2:=I think they blame the inequalities on
T: [yes
S2: the] mistakes of the superior whites before where er…er..um...because they thought themselves of the higher [status
T: Yeah]
S2: Looking down on African Americans
T: Yeah
S2: It created this idea that…it kind of ((increasing excitment))etched into people's minds that yes, African Americans are a minority group and they are [(should)
T: right]
S2: be treated like that so it just passed down like that
T: Ok, yeah, and S? ((S3 has had his hand up))
S3:(Unclear) Tyranny of the majority so...the majority took over the minorities, so the minority found it hard to go against so they had to go with it
T: Right
S3: And the constitution developed over the years to adapt to that
T: And in the view of the Liberals who...what...what...em what played the key part in taking apart this segregated, discriminatory ...em…society? What...what had to play a key role in empowering
S4:(unclear)
T: Sorry (directed to S4)
S4: Congress
T: Yes, so in other words, the…? ((Several students say something))Federal…federal government, ok, so it links to a power of government. Em…so…so obvious...so if that's the Liberal one, would it be fair to say that many Conservatives would disagree with that point of view?
S4: [they shouldn't but they would
S5 no, but...]

T: We:ll?
S6: The second amendment ((other students talking at once))
T: Ok, if we put the second amendment stuff to one side just because our focus is really on...on race here, H?
S7: Right this (unclear) it looks stupid but I think the Conservatives would find a way to justify it.
T: Yes, in…in what ways, for example?↓(.3)
S7: Like [(unclear)
T: Ok] they…they might justify the ...the fact there were ...there was discrimination against African Americans for a period of time in the South, em, S? ((S3 has had his hand up)).
S3: They believe that it should have been left to the states to take a decision whether black pe…whites should be there or not …er…it's the people's choice not what the minorities think.
T: Yes, absolutely, they might have emphasised a more majoritarian way. Em…wh...what...do Conservatives believe that America today is a level playing field? (1.8)
Several students at once: Yes
S2: They'll say you have the option...no they don't ((others students speaking))…yeah…yeah, they accept to some extent there is not a level playing field because of the fact that people (1.7)....they say that everyone has the opportunities, everyone's got the [chance
T: Yeah, right]
S2: but they accept that those with the more money, bigger resources will have...a slight advantage over those with less inf…less money and inf...rsources but they don't say that people with less resources are completely ...not...em …er…not acceptable.
T: Okay↑ K?
S7: Affirmative action wise they think that minorities (unclear) have no right and {er
S2:to the society?)]
T: Right, ok, so they think that...and ...and to link that to em…T's point, because there is an equal playing field ...a...a level playing field in society then affirmative action is unnecessary.
S7: Yeah
T: Ok, we...I'm just going to cut that off because we will come back to that later on to talk about em…the implications of ...of affirmative action because really what we're going to focus on today is the origins of racial inequality in America, but first before we do that what I want to do is to go back to some wider…wider conceptual questions about race relations just so we can frame this chapter ((framing gesture)) and understand the scope and purpose of it, so what I want you guys to do is to think through, take...em take a minute to think through what are the↑ concepts that this chapter is going to touch on? What concepts are going to be useful to reason through the material in this ...in this chapter, ok? Talk to ...through it in pairs.
((Students discuss in pairs: teacher scans from chair then shuts down computer))(1 min 22.6)
T: Ok, so what...what sort of que...what sort of concepts are we coming up with, R?
S8: Em…representation
T: Explain
S8: Because it's about representation of the people ...that will help looking into why...why people are being represented like this …why minorities are feeling let down (to?)
T: Ok...ok, so ...em what we're going to do next is come up with questions, so how could we turn that into a question?
S2: How well represented are minorities in Congress [or
T: Yeah]
S2 …in the House of Representatives?
T: Yeah, so how represented…how well represented are minorities in the…not just the legislature
S2: In society?
T: Well, they are...they are <u>in</u> society so we're talking [about

S2:(unclear)]
T: Well, how could we frame that?
S7: In US politics?
T: Yeah, in US politics but also, I think your question ((pointing to S2)) went a little bit wider than that
S2: Like in businesses and ...how well high up…African Americ…or minorities in positions of ...like high positions in…
T: so we're talking about...em…wide…wider positions
S2: [Yeah wider
T: of power] in the [United States
S2: [outside of] the political circle
T: Yeah
S2: About more of the society circle, as well
T: Right, ok…ok, cool, ok. What I want you guys to do is to spend another minute, turning your concept into questions, ok, so what ...what do you think we're going to explore? To explore this area of race relations, what will we need to explore?
((Students discuss; teacher circulates)).
T: ((To S2+S4)) Is that very...? They…they are necessarily big questions but ...that you'll need to...ask
(S3 has his hand up)
T: Yes?
S3: (Unclear) could you bring 'liberty' into it as well?
T: Em…yes…through...through 'rights' yes…but before you move…think about democracy and...well...think about the quality of democracy 'cos, as we know, there are different types of democracy , you know, Israel is a democracy, for example. ((Teacher moves to check work of another pair)) (16.7)_
T: Are you confusing perhaps 2 different things 'minority rights excluded at the expense of the wealthy' (unclear student responses) Ok, just have a think at how you might clarify that just to keep the focus on race relations
S3: Sir, 'how has democracy evolved into giving the minority rights in a majoritarian system?'
T: Yeah…ok.. .that's...I like the thinking behind that ok, but think about how you might phrase that, though. You might question an assumption, 'how has democracy evolved to give...' you might=
S3:= it wasn't a true democracy at the beginning
T: Well, would everyone accept that today? We...there is a true democracy?
S3: No, no, there isn't
T: So, so that's what I'm saying, you might need to question that assumption. Spend 30 seconds more (29)
S2: Sir, we're just talking about racial minorities?
T: Yes, yes (35.8)
T: Ok, let's…let's start to explore some of the questions em…ok...em Alisha
S6: I wasn't sure about how to put this into a question
T: Ok
S6: The role of the supreme court in...upholding rights of minorities
S2: I was saying the AS question last year[two ways (unclear)..
S6: Oh right... civil liberties]
T: Yeah ...ok…it's…it's exactly right so ...so to what extent has the Supreme Court played an important role in upholding the rights of minorities? Absolutely ... we might want to make a note of some of these as these will frame what we explore over the next two weeks. Em…er... P, can you...can you give us one, please.
S9: Em…well mine...'how effectively can the federal government and (unclear)...and there's one about pressure groups as well
T: Yeah, ok, so it's just the federal government one is going to be very important because we...as we've just explored briefly then the federal government did play a key role in the struggle for equal rights, and what's your one about pressure groups?
S9: The same question…just change it to 'pressure groups'
T: Right, ok…ok, so…because we know the American system is much more

pluralistic than for example in the UK, ok? Em, U
S10: I had pretty much the same thing ...I just add...em...pressure groups ...em ...are like rights of minorities put aside by wealthier pressure groups?
T: Ok↓Em…I wonder if we're confusing...I wonder if we're confusing the…er...inequality question with a race question (.8)
S10: Well, then, you just put race relations
T: Yeah, ok, so ((students laughing)) well, I think the thing is...like I was talking through with Sami you might like…er…some...for example S, your ques...just read out what your question was before...yeah.
S3: The orginal one?
T: Yeah, the original one
S3: How democracy evolved in giving rights to racial minorities in a majoritarian system
T: Well…I think that's a good question↑ but it assumes something, what did it assume?
S2: That the system was majoritarian?
T: Well
S7: That America is a democracy
T: That America what… is a democracy?
S7: Yeah
T: Yeah is a full democracy, ok , and it's this question about the quality of democracy we're going to talk about, ok, because if you're↑going to say somewhere is a full democracy what does that imply?
S2: Equal rights for a everyone
T: Yeah, every…every single person has equal rights and equal power. Yeah. In America the people are sovereign, in theory, but yet are they in practice? Ok…are...if you...due to the colour of your skin do some people have more power due to that very arbitrary reason? Ok? That's...that's what we're going to be exploring, so does...does...you know...although, yes, we would call America a democracy, is it…a full democracy? Is it…does...are African Americans ...I'm trying to think of a …eloquent question to sum it up ...are they fully represented perhaps in...like we were saying before?
S5: Are they given the same democratic rights?
T: Yeah↑ ok, yeah …democratic rights ok...that's…that's a good way of putting it(3.2) ((students making notes))
Right, any other questions? Any other questions which we think we might want to explore? (1.8)
S2: Em…I've got one...how far do…the rights of minorities help to create a healthy democracy?
T: How far do the rights of minorities…?
S2: Well...like...if...affirmation of rights...will be accepted…something like that it was just how I worded it...it just came out like that.
T: Ok...em…could you just explain a little bit behind that?
S2: To what extent does giving rights to racial minorities help to strengthen democracy?
T: [Mmm
S2: in a way]
T: Ok…mm…so I think what we might be getting at here is ...going beyond basic rights and now looking at affirmative action, for example, so to what...so…so...I think that is a very good question what…what you're getting to is...to what extent is affirmative action necessary to fulfil democracy? (2.8) Because there is a very sharp political disagreement on that (4.3) ((students writing notes)).If you accept that African Americans have basic rights (9.) what I mean by that is basic liv…em...civil rights ok, so the right to vote ...em... the right to own their own property et cetera…is that sufficient to be…to...to say that you operate in a full democracy? Are there social economic rights (.) that...that that are nec...that…that need to be fulfilled before you can be considered to be a full democracy? (3.3) Ok ↑We've kind of taken the word 'minorities' and I think we've mainly focussed on African Americans so far
S2: Hispanics

T: There are Hispanics as well
S2:The rise of Hispanics in recent times
T: Ok, what..what do you mean by the rise of Hispanics?
S2: Oh like ...where there's (unclear) parties of all sides starting to look at…towards Hispanic votes because of...also …generally the rise in numbers of them ((gesturing upwards)) because you know the minor...you know even though they're really small but the minorities also do help ...support parties.
T: And what evidence have we seen recently of that?
S2:(unclear) 2 % of Hispanics
T; And this is what we call the 'rainbow coalition'. Em…so...so how could we sum this up as a question? What question have we got to ask about Hispanics? (2)
S5: To what extent have rights been extended to...
T: We:ll..↑Are Hispanics coming from the same place as African Americans?
Several students: No (unclear)
T: Explain, U
S10: like they...(unclear) ... a question about how politicians like…what policy (unclear) ...like voters (unclear)
T: Yeah, so we could ask to what extent are Hispanics significant in US politics, as a voting block, to what extent have politicians tried to attract their vote but just to go back to a fundamental point, what's the key difference between Hispanics and African Americans?
S7: Is it the fact that Hispanics are (unclear) African Americans were slaves so they were put there
T: Yeah and so...what...what's the implication of that?
S7: Choice ((other students agreeing))
T: Yeah, Hispanics yeah have chosen to come ok, it's been a choice it's been a positive choice to go to America ok and so…so typically you know, when you're ...when you make that choice ok...you make...you make an informed choice ok, you might be fleeing desperate conditions in your home country but it is ultimately choice, ok? Em…whereas African Americans we know that was never...that was never a choice and so there's a legacy em…of discrimination that they faced. Have Hispanics faced widespread systematic discrimination?
Several Students: No
T: No…no...no...Because remember, the discrimination was built into the law of many parts of the United States.
S2: Specifically for...against African Americans
T: Absolutely…S? (in response to his hand up)
S3: The Native Americans were there before the European Americans but they weren't recognised until about the 1950s
T: That's very true ...em..yes
S3: But they don't have any rights
T: Well...er
S3: Maybe they have rights
[S2 unclear talking over S3]
S2: They have their own governments
T: ok, we won't...the scope...the scope of this unit ok, doesn't cover ...doesn't generally cover Native Americans simply for the reason they are very small in number em...in the United States and they are…they are their own spec...they are their own special group like that and they're much better a…analysed in the framework of colonialism, so you can go and study that at university either a history...a history course made with a sociological focus, yes (to S4)
S4: At Warwick
T: at Warwick…and other universities, ok, em, right, we're clear then that…that we're going to focus first on African Americans and we've got to explore, ok the back story, ok, because we can't just say, well, they live in a society now where there's equal...where there's equal basic civil rights because what do we know is the issue for many African Americans in today's America
S2: [Discrimination

S6: Discrimination]
S2: Like in economic environments as well
S6: Employment
S2: employment as well, yeah
T: (.hhh) Ok:ay ...em
S2: There's still this idea of discrimination against African Americans in some areas
T: I think↑ that is contested the degree to which there is...em… discrimination and we will explore that because that is a very live debate but what can be said with certainty about African Americans in today's America?
S5:(unclear) ((knocking from other classroom))
T: I'm not sure about that ...I'm not sure about that, yes there is certainly a diff...a wide spread inequality ok, widespread inequality ok, and it is a very hot debate about whether that's the result of discrimination in today's America or whether it's just through past discrimination, there is a very wide ranging debate and that's …that's one of the key things that we'll look at, ok. Any questions? (2.1)No? Ok. Em…right…so the key question we're going to look at today then ok, let's...let's make a note of this if we haven't already (2.9) So what are the origins of racial inequality in the USA? (11.4)
S2: Is that an exam question or not? It's not a specific [exam
T: No, it's not] a specific exam question but it is to...but it is really necessary to understand the backstory in order to understand the debates em…surrounding affirmative action (9.4). Ok what we'll do in a moment is to rearrange you into groups ok, and in your groups I'm going to allocate you a period of time so I want you to listen out for your group ((teacher organises groups - not transcribed. Periods of time allocated: slavery and reconstruction; Jim Crow period; 1930s-1950s; the Civil rights movement))(1 min 25.4)

T: what I want you guys to do within this ok, is to pick out the most significant events in the time period ok...the most significant events ...that...the...the narrative is all about in…inequality ok, so I want you to pick out the most significant events relating to inequality in the period so, between 5 and 10 events I want you to record it on a post-it ok, at the end we're going to make a big time line of the period and I'd want you to be able to sum up in depth and relate it to our concepts the overall narrative for your sub period, so if you're looking at the Jim Crow period I want you to be able to explain what…how...did...did… was inequality lessened during that time period if so, why? And relate it back to our concepts, ok I'll give you 10 minutes initially to do this, ok, 10 minutes. So you might want to split up…I'll pas out the post-it notes((students move into groups around the room))(1 min 35.2)
S3: What's the exact stat
T: What do you mean, stat?
S3: Was it 1/3 or 1/5?
T: Well...like I was saying, there's 2 different things, though, because so in the Constitution yeah, I think the…the African Americans or slaves as they mostly worked on…the Constitution defined as, I think it as 1/3 of a man but then their vote...their vote was exercised by the slave owner
S3: [(unclear)
S1: so the more slaves they had]
T: Yeah, in the southern states ...yeah so the more slaves you had, the more votes you exercised, ok, but what you're looking at is the Jim Crow period, so what...what does the Jim Crow period come after?
S3: So it comes after the constitutional amendments
T: No ...well...sort of...what big event does it come after?
S1: Civil war
T: The Civil war↑ Because who won the civil war? Yeah…the the north, ok which supported the liberation of slaves. But what did the southern states do after the civil war?
S3: (unclear) because they were ineffective in the south, they were only effective in the north

T: Yeah, because the state governments rode roughshod over the rights and effectively ignored the rights and...and what was the attitude of the federal supreme court towards this?
S3: Em..they sided with the north
T: nope↑ Not in the Jim Crow period
S1: So, they didn't really care?
T: Yeah, we know about Plessey versus Ferguson?
S3: Oh yeah!
T: What did the Supreme Court say? ((S1 + S3 writing)) (2.0
S3: They said em...it was...the right of the states to choose whether the...the rights should be implemented
T: Whether what rights should be implemented?
S1: Not civil rights but like...basic…
T: Discriminatory laws, so we know for example that the southern states had lots of laws concerning segregation in education and so Plessey versus Ferguson upheld the idea that separate could be equal, ok? (1.2)
S1: That was only overturned Brown versus (unclear) case
T: Yeah, in the 1950s …But I want you to...where are your notes on the Jim Crow period?
S3: (unclear) on my phone ((gets out phone))
T: Ok, on your phone is fine, where are yours (to S1)
S1: I've left mine at home
T: That's quite basic isn't it?
S1: But I have read it though
T: Right then you shouldn't have much problem doing this, ok, so you need to come up with 5 …try to come up with 5 events, ok
((T circulates))
T: Which ones are you guys doing?
S5: Reconstruction (unclear) so basically, that's the point when the northern troops were still in the south, right, so things started looking better for the black people who thought that maybe they could start getting equal right so
T: Yes, yes
S5: And the special order but basically it was short lived 'cos as soon as they left [Johnson
T: Yep]
S5: I think it was, he repealed all the land given to the free slaves
T: Yep, Yep
S5: And then...em yeah ...(unclear) of the 13th,14th and 15th amendments it was practically meaningless
T: So...so the role of the federal government for a while...what did the federal government end up doing?
S5: At the start there was the illusion of extending rights but Johnson just ripped it back
T: But...what...ok...but...who...under pressure from whom?
T: The southerners
T: Yeah, the southern states, ok, so it was the state government
S5: While the north was involved they kind of
T: They kind of just...like...backed off
S5: Yeah
T: And retreated back up north ...yeah...so we're literally just talking about having a …a...a... north...well ...a federal presence on the ground to actually help enforce anti discrimination measures
S5: As soon as they left
T: Yeah...then it went backwards, ok. (5 mins 05) ((Teacher circulates, deals with admin issues as head of 6th OK GUYS, YOU'VE JUST GOT 1 MINUTE, SO MAKE SURE THAT YOU CAN SUM UP THE PERIOD, OK , ok, make sure you can sum up the period. (56) Just make sure you can explain the whole period, ok, so F you should be talking it through with K and A
S5: Sir what was this slaughter house case? It says(unclear) of the 14th amendment only applied to the laws and the actions of the federal government.
T: Yes, so basically the southern states didn't need to apply it, so they could continue to discriminate against ...em African Americans (35). OK

RIGHT I WANT YOU GUYS TO COME OVER HERE AND BRING YOUR POST-IT NOTES OVER AND I WANT YOU TO ARRANGE THEM CHRONOLOGICALLY, so if we just move chairs and other things out of the way (2 min 08) ((students clear tables and start to arrange their post-its)) (22)
T: So where arr you going to put those? (22)Right, that's something that happened over a long period of time , right pretty much from the end of the civil war right through to 1930s (6.5).RIGHT, LET'S…LET'S …LET'S START TALKING THROUGH who had...em...the early period? Well...from…emm... the civil war onwards …who had that period? Who had that period? Well the civil war comes before Jim Crow. Ok who had the civil war?
S5: We had the reconstruction...is that us?
T: Yeah...civil war and reconstruction ...did you have the civil war?
S5: We thought someone else had the civil war
T: No...ok, well let me talk through at the outset, because what do we know about the Constitution?
S2: It doesn't count black people
T: No, what does it count
S2: 2/3
T: not 2/3
Students: 3/5, 60%
T: Is it 3/5? Ok...ok, and then who ...3/5 of a person...and then who exercises their vote on their behalf?
Students: the slave owners
T: The slave owner…yeah...the slave owner, ok…em…so we can say that slavery was hard wired into the original constitution. Why should this come as no surprise?
S6: Because they had just come =
T: = Who wrote the constitution?
Students (slave owners/whites)
T: White men ok, ...who were [all
Students (unclear contributions)]
T: Many of whom, the southerners, for example Thomas Jefferson, you know, great man, very enlightened, a proper enlightenment man em…a polymath…like a great deal of learning, built his own house, well not actually himself because that's what you have slaves for, but designed it himself along classical European lines
S7: (Unclear)((laughing))
T: Yes, I know but on classical Eur...a man of great learning but yet he was a slave owner (.) and he took one of his slaves as a mistress
S7: Really (unclear)?
T: Yes absolutely, so there is always a question about… is that a consenting relationship? Possibly not.
S1: Sir, is that why they bought loads of slaves then, so…
T: Slaves were expensive because slaves were a commodity, so you wouldn't do it just to ...yeah (student comments inaudible. Yes there was a thriving market …yes so there were slave auctions and worse so we know...we know in this period it was hard wired into the constitution, ok ...em and it remained so…and there was a great debate ok throughout this period about whether or not slavery should be abolished or not...and who do we know resisted the steps towards abolishing slavery?
Students: The south
T: The south. Who's seen the film 'Lincoln'? Yeah (some hands go up)

(End of recording)

Appendix K: M 15.3.13

M's commentary on observation 1

R: ((Watching the start of the lesson)). Is that your usual set up?

M: Yep, partly because it's so discussion based. I've been in classes where it's in rows and you can't hear if you're in the back of the classroom what other students are saying. ((Watch discussion)) (32)

R: They seem quite comfortable with that way of working.

M: Yes…yes I think it's because I've taught this same class since Year 12 and so they know what's expected…em in those situations…and we discussed the rationale for that at the start of the year…that the lesson is explicitly discursive in style and you're…you're discussing with each other, not just with me. And I think I've changed where some of them are sitting normally so Umar would sit with male students and wouldn't normally work with amrita but I have directed him to do that…to make him a little more purposeful. (1 min.22)

R: So what's the purpose of these groupings?

M: so, for these, it's where they're looking at the Elements together…I'm trying to think how I structured it…oh yeah, I think I gave them…because I divided it up…I divided up the elements into ones that everyone should cover and that's highlighted in red on the screen and the ones the stronger students should cover…so they're grouped roughly by ability.

R: Right, ok. (16)

M: But all this is underpinned by the fact that the students have done the notes outside of lessons before. (4.7) It relied on a lot of trust, really, to allow the students to go out there and get on with it which I think by Y13 it really works. Y12 is a kind of difficult time where I think you have to be much more directive with students and ensure that they are actually on track. (13). I'm probably spending time off camera because it's V, U and S who are the weakest in the class. (35). I think that's the advantage of a discussion based approach is that none of them wants to come back to the table with nothing to show… there is that kind of competitiveness within the class.

R: The boy over on the left…I don't think it's the textbook, I think it might be other notes he's making.

M: Yeah, that's H (3.4) It might be some of the articles as well…and that's another thing, I can give you access to the Fronter page which hosts all the links to different articles because the language demands of those is quite interesting because I started out mostly with Economist articles but…since…I've since mixed it a lot more with more BBC style articles which…em are more suitable for students chasing C grades.

R: that makes sense because the boy who sits there when he comes back talks about an article he read to do with fracking.

M: Yeah, that would be it (1 min. 08) With that example, both boys study economics so it's easier for them to tap into that example.

R: What seems to be happening now on that table is that it's opening

up into a sort of table discussion completely independently of you ((laughter)).

M: Yeah…often that does happen and sometimes it's really good…but sometimes I just want the students just to hold ba:ck just so when we come together as a whole class we can have that discussion…so it kind of depends on the nature of it really.

R: I think…I think it was because they…they were questioning something about assumptions or something, em…so supporting each other I suppose. The oother thing I notes…was the boy who's off camera here was talking about "wouldn't you argue that"…and you talked in your interview about the importance of argument.

M: Well it's one of the key skills in politics…there's…there's one of the marks for AO2 is about synopticity so being able to think through…you know…er a political issue from the perspective of a Conservative and then of a Liberal in the context of American politics, so it is something that…you know…I've made quite explicit to students, it's a skill they need to develop. (2 mins 52). It's quite interesting from that discussion…

R: What's interesting?

M: Just to hear that they are very much em…using their…their wor…their economic understanding and applying that to their…to reason through the example they had been given. That's quite encouraging really, because we always say how much they compartmentalise their knowledge but…(4 mins.17) I think this is the advantage of using the Critical Thinking model here em…just because it gets the students to unpick the whole package of you know…the…the whole system of beliefs because it would be very easy just to describe the beliefs…em…but what the Critical Thinking model does is…is give students a way of really what underlies them…so…you know…I'd expect then that students in their essays would be able to recreate that's et of views when arguing what they…they actually believe in.

R: And when you probe them you hear them explain and give precise examples and the're actually able to articulate quite a lot…if you did a time analysis in terms of time spent on what students are saying and what you're saying, it's going to be weighted in this lesson more towards….er…students.

M: I think I'm incredibly lucky with this class because they are an incredibly motivated class.

R: Or is it because they have been trained this way?

M: A bit of both, as not all my Y13 classes have been so keen and so able to work for an extended period of time in pairs or…or in groups. There are some students in the class for whom this isn't their natural way of working and they might work very differently in a different style of clas but because the majority are keen to work that way….you know…that those follow.

R: And you check they have the basic knowledge through Fronter tests they have to do.

M: Yeah…I don't do Fronter tests with these guys, just Y12s. Partly that's because the examples are much more fluid in American politics and so, there's no core which stays the same, if you like…and also I think there's a value…the tests are really quite er…it's almost like…a fail safe method to ensure students are accurately

comprehending the material in the book… I think there's some value in Y13 to letting go a little bit and letting students decide how far they've comprehended the notes…the material…just to prepare them for university. (2 mins.35) Also, on Fronter, you can see the homework that I set to give some idea of the assessment cycle. (6 mins 25).
That's really good for U, it's kind of….em…you know…sort of like the penny's dropped if you like about you know where we're going with this and why we're analysing the shift and because then the focus will be on electability and whether the Republican party is, you know, become too extreme to…to win elections (2 mins 24). And so what I'm trying to get students t do is sort of see the limitations of the labels themselves so that they see they are just categories that can themselves be challenged. (4 mins 40)

R: In term so what they did in the subsequent lesson …what…how did this lead into the next lesson?

M: So, the next lesson, they…em…analysed the current state of the Republican Party so, essentially, which faction was in control of it and then, from there…they…em…write an essay…and that's where we left it so…then…after we will review the essay on the Republicans. We'll spend probably about half an hour doing that…and I'll photocopy one of those…that's the activity we do in class…then we'll peer assess, and then they go away and redraft the essay and then I'll take it in and I'll mark that.

(End of recording and commentary)

Appendix L: M. 28.4.13

M's commentary on observation 2

M: So, generally with this, I'll choose someone who is more able and...and ... I'm fortunate in this class as they're 6 or 7 I can choose from, students who should be looking for an A or a B grade...because it gets a little problematic if you do it with students who are chasing a C or a D grade because for the more able students although they can critique it, there's very little they can learn from it. ((1min.56)I think it's about mixing up your styles of teaching...you know, if it was an article for example I would typically get them to do that at home…not least because then they might have to go away, look up words or certain references and so actually to do it in their own time is kind of a form of differentitation whereas for this, it creates quite an intense ..you know...you've got 10 minutes to…to…evaluate this…and...em...by this stage in the year they're well practised at doing that.

R: I was going to say, they know what to look for (.) when they evaluate

M:= yeah, yeah, yeah (10 mins 37).So pluralism and democracy are part of the key concepts (.8) and it's also the big synoptic question at the end of that chapter…em about whether the activities of pressure groups are democratic(2 mins 33). So that's what they get their AO2 marks for, being able to evaluate from different perspectives, whether Liberal or Conservative or centrist on this issue. (2 mins 59).Because that's another way to get the top marks is to be able to link different aspects of (unclear) together.(4 mins 45)((After listening to teacher explaining students will then redraft their own work in the light of the discussion of one answer covered in class-)). I've found that...that's been the most...the most effective way of getting students to actually enact you know…sort of...their form… their own formative comments from each other and as you see...they're...they're able to correct any misunderstandings or …er… clarifying any…any outstanding issues.(5 mins 26).This is partly a recap of what we did in the previous unit so what students studied ...em…it would have been back in October em…'cos…then...then they have to analyse how pressure groups actually get in and influence the senators ...so they look at institutional design. (2 mins 47)

R: Again, I'm struck by the nature of discussion students seem to be generating by themselves.

M: Yep...I can confidently leave them to it and expect them to try to reason through something.(3 mins 24)

M: ((T gets pairs to move round)) Just to break up...em...the conversations ...em...and to get them to explain to someone different ...em...their ideas and get be able to justify the ideas...em (12) and I'm also aware it's an afternoon …it's a double...and do something active (2 mins 27) and the knock on effect is, you can hear it the level...like...the level of discussion ...because it is something where there is no right answer so it's an (event) for debate for long time. And also, what I think, one of my reflections watching that is the way students chip in , it shows a sort of engagement with ...er..with em...the input so they're not...the're not...they will cut across me if they disagree with something and it's kind of em...very sort of democratic like that and em …that's...that's exactly what I want because ...you know...you want that...that that complete engagement and sort of…during those more extended discussions (1 18) and that's the thing...and for that lesson it wasn't just the textbook they'd read through they'd also read through a number of articles on Fronter on the NRA and I think a few

other examples...Liz Fowler as well, so that's where the discussion...that's what the discussion was informed by.

((End of recording))

Appendix M: J. 25.2.13

Teacher J interview script

R: Thanks for agreeing to be a participant in my research...in this interview I just want to ...em…explore the nature of your subject at A level em...your…use of Critical Thinking and how...and how that's gone, basically. So, if you had to...well, I'm asking you as somebody who's not a scientist to identify or explain to me what are the distinctive features of...em ...your subject, biology at A level.

J: So, the distinctive features of my subject are ...em... it's ...it can be quite content heavy so there is a fundamental base knowledge that pupils need to have em...of sort of ...recalling ...as the subject is...em very sequence based a lot of biological systems are …em….a logical sequence of events so pupils need to be able to recall that sequence…And they move onto sort of the higher order thinking of it there's a...em…there's a high mathematical element↑ so pupils need to be able to analyse data↑…em…from experiments (.) they then need to be able to explain that data applying those concepts that they know...em...to known and unknown situations so they give…be given a context that they haven't come across before but use the knowledge that they have to try to explain why that would happen or suggest mechanisms ...And there's also a creative element where genuine experim…experimentation is a creative process where they have to…you have to ((clearing throat)) come up with a protocol that could investigate it and then reviewing it, work out how...you know...analyse that data if it doesn't show the trend wha…why doesn't it and how could you adapt it so... a lot of evaluative skills as well in terms of why hasn't it worked, what would I change …em (1.2) I think that's it.

R: Mmm (.hhh) What do students find most challenging?

J: Em…it's the evaluative bit ...em …most students ...em..will..the...will recall and ...em...describe, explain fairly confidently, the analysis, most students are pretty good at actually but because it's a very…you can do it in a formulaic way [so
R: Right]
J: So you can teach them, you know, the steps you go through to analyse data, the bit they struggle with is the interpretation to (.9) explain particularly out of context eem...'cos you can teach them when you know a particular …a particular...em… known idea ...em and then, if you give them data for that known idea they...the...most students will be able to explain why. As soon as you give them an unknown context where it's slightly different they struggle to make the link between the two things that they've done ..but the bit they really struggle with is evaluative skills. R: Right .
J: so...(3.4)...em...for example, why wasn't ...why wasn't a study ..er...what makes a bad study, why is it bad, why....er...what's its limitations and how would you improve it? They find that very difficult

R: How do you go about teaching that then?

J: Em.. (.hhh)...so (hhh) ...>so for me < so...for...the evaluative bit?
R: Mmm.
J: So, in terms of evaluation, it's…er...getting them to ...em...they just...they struggle to…to do the linking thoughts↑
R: Right
J: So …em…using the leading questioning and sort of …er…so it's trying to get them to use a 'therefore'
R: Right
J: 'This caused that' so...and so they need <to use the > 'therefore' what does that mean? What's the significance of that...so trying to get them to

extend their thinking into multiple steps ...em…because to truly evaluate you have to link a whole lot of stuff together and then come back, almost in a circle at the end of...'so therefore this is what I'm going to change'.

R: Mmm. do they have to write that out formally? (.) Are they required to do that in the exam?

J: Em. not ..evaluative...not so much it's mainly for coursework , there's a section for… the coursework that they really have to do ...em analysis ...and ...em...conclusions so con...explain why things happened …all…all the time in exams.

R: Right...and in extended writing do they have to do that?

J: Mm...yes, so at...em...A2 your maximum marks we're looking at around probably 6 to 8 ↑So...extended writing? We still teach them to do it in bullet points.
R: Right
J: So, it is extended but we use bullet points to help them to structure their ideas in a more manageable way …em…to help get the logic ...em…so they...so they can check their answers are logical and that they've got a sufficient amount of depth for that answer.

R: Right ...ok… and what would be distinctive about getting an A or an A* in biology A level?

J: Em...we had two students last year who got...sort of…who were getting 120 out of 120 UMS so...in terms of exam performance, high performing students ...what was very interesting was that they both have completely polar opposite revision strategies which was quite interesting em…but ...both of them it was flawless knowledge of the content, em...their ...in their descriptions and when they were explaining…they had flawless use of the technical terms↑ so they had a total mastery of the terms …students will quite often be vague, for example, 'it went into the membrane' as opposed to ' the positive sodium ion passed through by passive diffusion through the membrane into the intracellular fluid. They've both said the same thing but the specific detail is what gets them the marks. Em... the other em…main thing is that, as I've said before, <a lot of it> in a logical order, many students will...what I use the term 'come in half way through the story'↑
R: Right
J: So they don't start at the beginning, they'll sort of come in half way through and it doesn't give them enough room to…give a sufficient number of separate points↑ so those students who do very well can ...start at the beginning of the logical sequence and therefore have...they can get all of the steps …em ...because there's the difference really between…especially between an A* and an A is that on those long answer questions you can't drop a mark so you have to get all of those marks every time, virtually, 'cos you can only drop something like 8 marks↑ so, that's …that's the real difference.

R: Right, ok, so you…you may have covered this bit, it would be helpful if you could just sort of em…clarify if you had to explain to somebody what does it mean to think critically in biology, what is crti…what does...where is the critical thinking in biology, I suppose, what would...what would you say?
J: So...for me ...er…critical thinking in biology is em...as a teacher it's making the thinking process ...process explicit >
R: Right
J: So …em… pupils will implicitly have skills and different ways of thinking but they quite often won't know when they're doing which ones and therefore they don't know ...in a given context well, which one should I be doing? So they will describe when they should be explaining or they

will conclude when they should be analysing so...for me it's making the style of thinking explicit so...em ... when we use sort of the Bloom's command words them knowing if it's asking them to describe, what does a description answer look like? What does an explanation look like? What's an interpretation? What's an analysis so that they know the style of answer and how they should lay it out...em...therefore...so that it will be in parallel with the mark scheme …em...because it's quite common for students to misinterpret what the questions want so what they've written isn't wrong it's just (1.9) the wrong style of thinking ...em… (2.2.) Also for me, it …it's the …to (2.1)...at the top end this…to...critical thinking is the…getting students to really evaluate and challenge their own thinking to say, well, when they've just given an answer getting them to think, well, is that correct? Is...what is the significance of it? You know, ...er…how does that link with that? Can you, you know, evaluate your own thinking, have you actually come to the right conclusion ...em you don't know, but if you actually think about it further you can work out whether that is correct or whether you could take a slightly different line.
R: Mm...mm ok. So you did the programme a few years...2 years ago now
J: Yep
R: Em…how...wha...what sense have you made of the Critical Thinking model in terms of your teaching? How have you used it?
J: Em.. I think…initilly so..I did it quite a few years ago so…I think it was probably about 2 ½ years ago?
R: Yeah
J: So I think at the time I was ...my >practice< I ...I think I took on a lot from the course but I think at the time I don't know whether my practice was quite at the point to take on a lot of it because I think a lot of it is …in terms of teacher skills I think quite a high end... skill so, initially I...I put some things in place but I think for about a year probably about a year eighteen months I think it fell a little bit by the wayside ...em…and then in the last year to 18 months I've been really trying to …I think...got to grips with meta-learning and started to see the ...I think I was already using some things implicitly anyway because they just ...em ..they were just part of my teaching but I think over the last year making them a lot more explicit and I have…have started to go back and look back through the critical thinking like the Standards...the Intellectual Standards …em…and to have more of a routine of adding those Standards and those questions into lessons to challenge the students …em...so I think ...and I think...I've become a lot more explicit about when we're doing different types of thinking and what does it mean.
R: Can you give an example of ...of…of how you make it explicit now whereas (.) in the past it might not have been explicit or hidden.
J: Em…yeah]...so...em (3)°let me think of an example (2.5) yes so…for example...em I used to just (unclear) write instructions up on the board em…now whenever I use a...really a th...th...a thinking strand for...I always put it …I always put it in italics and I highlight it to pupils so today we are going to be doing explaining and I'll sometimes ask the students you know what kind of answer will that be ...em…and ...er...so …in my head I've got a list of them so when I (go) to a pupil and they ask me something I will go through sort of a routine of questions like significance and clarity and depth …em ...so that em…I know that that can push their thinking further. Sorry that's not a very good example=
T: =No, that's fine, that's ok. What about other aspects of the model like the elements or concepts?
J: Em…I think …(2.3) I think for me the weakness in terms of my critical thinking at the moment ...I think I use lots of them independently what I'm not really applying is the whole model cohesively↑ So, I think if you asked my students ...'Do we do Critical Thinking? Some may say yeah, some may not. They know that ...if you ask them about the different types of...you know is it explicit about the different types of thinking I think they'd know that but we...if you ask them what are Intellectual Standards, they wouldn't know.
R: Would they need to?

J: Well, that's what I think, probably not, I think...I think it's up to me as the...practitioner to pick that apart and take the bits that are relevant to them…em and apply the skills like you said we've got some...some of the brightest students may take on…the whole concept on board but I think for most of them it'd probably be a bit beyond them.
R: Ok↑ Again...you may have covered some of these but in the development...in your development of the use of critical thinking what...what have you found that have been sort of blockers or difficulties and what have you found that enabled it and supported it?
J: In students...or the department?
R: It could ... all of those or any of those.
J: (.hhh) Em (2.2) (hhh) I think ...I think...there can be...I think in …er..'cos in key stage 5 I try to sort of spread ...spread the…the concepts out.
R: Mmm__
J: I think some people are resistant because they just don't ...have the belief that…in meta-learning which I think is a real shame.
R: You say people do you mean students or colleagues?
J: I think colleagues
R: Right, ok
J: Em…I...er I think (2.5) problems with students? I think em...students can sometimes be resistant because it's difficult so..((laughs)) especially when I always find when you start to push the…an evaluative angle you can see them going ((imitates students)) 'Aww' because it hurts...but it should because they're having to really think em...so…that can be difficult, and trying to get them to...because I think sometimes it can get to the point where they're not resilient enough to actually push (0.7) themselves and so you will still <even though you put that learning opportunity there >you will still get back some ...pretty unconnected answers em...so for me I've tried to sometimes move the evaluative bit earlier in the le…because often the evaluation comes at the end but by then they're quite cooked so ((laughs)) I think you've got to plan your tasks so that sometimes you can get some of that thinking when they're still receptive, when they've still got the energy .
R: you were talking about colleagues and then I sort of interrupted you
J: So...no that was em…that was pretty much students
R: Yeah
J: I think (1.2) I think there's just a lack of ...I think a lack of understanding em...in colleagues sometimes ...what the importance of meta-learning is ...em I've become quite passionate about it recently I think because (1.6) as we always sai…like the classic example we have is...maths do graphs all the time ...and science do graphs and yet the pupils can't graph most of the time ...to save their life...and it's because they can't link the two…to them they are two completely separate things and I think that if all of us were being a lot more explicit about…this is a graphing skill, it's not a science skill, it's a graphing skill, we're doing analysis , this is an analytical sk...then they would see that ...the way they were thinking as separate units rather than subjects as separate units …em because they're going to leave your subject ...you know I teach them this fixed box of knowledge but that's not going to help them really, probably most of it, you know you're going to go away and you won't use it, 'A' level biology, but the thinking you have is what's going to help you, so making the thinking explicit will give them some...such genuine skills for life, whereas the content you teach them is really a method to teach them the thinking.
R: And so...what about...any other blockers...how does the syllabus support or not the development of this type of thinking?
T: Em...I think...the classic is 'I don't have time...I don't have time to do it, I've got too much ..too much content to do with thi...there's too much of the course I just need to...I need to in inverted commas 'cover the content'...em…and I think that's a massive misconception that it's extra...'I have to do my lesson then I'd have to do some extra BLP or some extra critical thinking rather than thinking of 'well actually I can integrate it into my lesson and it will help me cover the content quicker'

Em...and maybe just headspace...and time ...that people just don't have the time and the headspace to sit down and ...think for a little bit before they plan their lesson em...and even myself who...like I said I'm quite passionate about it I sti...it still takes some discipline when you're planning to actually sit and get the book and look, for just a minute and take that minute to think it into your lesson because you're rushing and you've got lots and lots of other stuff to do.
R: Have you worked with anybody else in any other department er…in terms of Critical Thinking?
J: Em (hhh)...I've done...some ...like I said I...I ran a 'good to outstanding' group so I was talking...we were talking about differentiation and I was talking to them about how you could use Socratic questioning and...er...some of the Critical Thinking...like em...er...like the Elements of Thought to help challenge and differentiate at the top end em...so we discussed that and that I've actually recommended that one of them go to the Critical Thinking Course because they hadn't ...em and I've worked with colleagues inside the department, some of the younger members who, and again, sort I think they can take on board but only to a limited point because I think until you've done the whole course I don't think it makes as much sense.
R: Ok. And what about things that have enabled it or helped you
J: Em... I think when I've had ...I've done some ...er work with outside agencies such as the British Council and I went to ...really just conferences about out...outstanding practice and ((cough)) where teaching should be going and getting the time out of ...school. I use the phrase 'out of the trenches' em...just to actually talk to other educational professionals and just for having the space to think about it I think helped a huge amount when I came back so (2.0) charged and refreshed realising and stepping back and going 'actually, this is really important' and that...that motivates you to take the time ...em and so I've ...that's actually changed how I've been doing, you know …and I'll make ...make sure that…even though I've got slides for all my lessons done to go 'well, just because you did them a year ago it doesn't mean they're up to date and so going back...so how can I ...include some meta-learning in this? How can I include some Critical Thinking? How can I increase the challenge em...and...yeah just being strict with yourself and making sure that you do plan it in ...em and it becomes part of your routine.
R: So…coming towards the end now, ...sort of interested in terms of what no…what impact on students have you noticed from your way of working?
J: Em...(4.2)...em…I think…it's a little bit multi factoral because the other ...thing I've been really ...been pushing is sort of independent learning.
R: Right?
J: Em...but (2.5)...I think (1.7)...overall ...I find students much...like…using sort of the Critical Thinking model where you've set up all the questions and they're sort of hierarchichally ordered em…and...the...the challenge I think in the lesson is much better and I think there could have been students years ago who would have probably cruised your lesson quite happily ..em and now I definitely getting…can I give an example?
R: Yeah, sure
J: Em...so I set up er...what is a very...one of the most difficult concepts respiration in biology so a cla... a couple of years ago I would've …they would've probably...quite (a few) they would have come in and I've said 'right we're doing respiration today. I would have talked them through the whole of respiration which would have taken probably half the time, and then said 'right, now I want you to recreate your own model from using your notes.' Emm...whereas this time I've set them ... I gave them instruction notes for homework and they had to do...and they cam in and I had 3 level tasks...em…so one was to be able to draw it, using their notes; the 2nd was to be able to recall it in groups; and the last one, this was the bit that really applied the critical thinking was …they had to apply it to design ...how would they design an antibiotic? So ...and it...that was sort of...how would you make the links, what ...er...what

would be a logical ...em...what would be a logical series of events for how you would tests it? Em…can you clarify what...what problems you make have …and it was a really open task but with a real focus on different strands of thinking and the…the most able kids just loved it and because they'd already got through ...they got to the point where they could recall the information which they need for their exams and that really pushed them and challenged them ...I just had the best discussions em...you know, someone saying, 'well, will that work? Why? And someone says 'well I don't think it will because of this…' and you can just put this little probing questions in and you can sort of twist the conversation and pull them in different directions em...and I think it's probably one of the best lessons I've had this year.
R: And they responded positively?
J: Yeah, definitely. And em...even it's ...I don't think Critical Thinking is just for the top end
R: No?
J: Em... 'cause...and I was using the same sort of terms for the others...you know...is that ...can you just check...for example, can you check …is that sentence 100 percent clear, can you improve your clarity. But for me I have to say I find it most useful for that top end because they can actually take on the ...the concepts a lot easier and can apply them a lot so you can…you can really push them.
R: Ok…and ...em the sort of quality of work that they produce maybe their notes or written answers or their…you know...
J: (hhh) Has that improved? Em… (5.9) °has it definitely improved as a result? (1.5)
R: It may not have improved…some of them may have ...some of them may not just what... have you noticed any difference or impact?
J: I think ...em ..(hhh) I do think they're better thinkers...I think they …they are ...they're more ready to challenge …sort of when people have discussions they're more ready to challenge other people's thoughts …em…and they're...their independence is much much better... em so you can...you know, the use of them ...them...they're going to be doing ...it's not ...they're much more...they are independent learners, not passive learners so they will...you know...they will work in a group but genuinely work together with other people contributing but challenging and discussing and analysing whether what they've got is right or how could they redo it to produce it ...em…and for me that's really pos…'cos that's ultimately where their ...where learning happens. Once you leave school this....I think most learning at university happens with your friends or in the library not in the lecture hall em…so..for me that ...I feel more confident about when they leave here they're going to have the skills to actually teach themselves how to learn or have the skills to know how to learn themselves.
R: And how well do you think they think as biologists?
T: (3.7)↑ Some of them, very well, some of them still do exist within the narrow window of what you're talking about and they ...will fail to make links but some of them do…you can start to see them ...and what I think is probably the best thing about biology is when you can explain a...a...phenomenon, you can see or feel yourself and you can go 'actually, I know this and I know that, so this is probably due to that' which I think is the best thing why I like, why I love biology, em some of them will start to do that and they'll like 'ahh, is that why?' And you can see them ma…I think that is really positive em...because they are thinking as biologists, you know, making an observation, applying a couple of different things that they know and pulling that together to form their own (.) argument for… or proposal for why that would take place.
R: So there is a role of...there is a role for argument in biology.
J: Ah definitely, definitely em…I think (2.7) because not all things are known so you could argue it either way and there is a huge amount of ethics within ...em...which would be a very good area, probably an area of growth for me in terms of Critical Thinking because they're not...it's probably one of the worst debates this year, actually, em…and they wouldn't...they didn't engage with each others' arguments and they

wouldn't…I don't know if it's how I set it up or…but it was one person making a statement and then another one making a statement without any linking em…but I have had before debates with students when they're really good and they will take someone's argument and go…well…sort of twist it and put it in another way, so that could definitely be a good area for Critical Thinking
R: Does the...does the...syllabus require some kind of =
J: = It's quite heavy on ethics em…all GCSE A level have a heavy amount of er...ethical issues.
R: Right, ok
J: Em...so, yeah
R: My final question is sort of like a really open question and it's if you could develop your teaching in anyway you like regard…you know, free of any constraints of the syllabus or whatever, what would you do and why?
J: How would I change my teaching?
R: If you could develop your teaching any way you like where you weren't constrained by the curriculum or assessment sort of, in an ideal teaching paradise, what would it be?
J: Em....°what would I change? I think one thing that's come up recently is this discussion on white space so ...em...
R: What's white space?
J: The concept...this came out of the conference I went to, they were saying having a white space in your curriculum where it's not specifiction time or it does not, there's no definite outcome, you just …em…they were saying one of the major problems is that science is taught as a sort of ...fact based you know purely analytical subject whereas actually real science is a highly creative subject but that's just not included em...you know, in most schools , they'll be given a standard practical, they'll be shown a complete standard practical and asked to replicate it which is completely unlike real experimentation, so I would like to have large open spaces where you can give them a whole ....give them a lab and some random equipment and either a problem or either say, give them a really open problem and say 'I want you to solve this'. So...so that idea of STEM of, you know...science engineering , technology and maths ...but them actually work through a real …to really make something and try it, and then it not work, and actually allow them to fail and then go, 'well, why did it fail? And going through the real proces of actually...you know...rather than...we always tell them that ,' well so and so discovered this' they don't go 'scientists worked for 20 years and had 20 years of failures and eventually discovered this' and so allow them to have that real experience of science as it is as a genuine creative discovery subject.
R: Lovely, ok. Is there anything else you'd like to add or make a comment on in terms of your A level teaching and Critical Thinking that we haven't covered?
J: Em (5.0)No, I think so…not really I think just for me my philosophy this year ... over the last couple of years with mine has been about pushing them as independent learners to get them doing the work, to minimise the amount of time to...I always...to have myself as a facilitator and not the lecturer so I will intervene and discuss always in small groups , I try never to ...to talk at the front em...and it's always about trying to increase the challenge and the...within the lesson, so that's...that's my °ethos.
R: Lovely, thank you very much .

Appendix N: J.7.3.13

Lesson observation 1 transcript

((Teacher calls register as students enter lab. Teacher at computer. Task on board questions on board ready for students to address as soon as they enter. On whiteboard teacher has written: Clarity; Relevance; Logic ;Depth))

T: Ok, questions on the board, before we move on. Can you think about what we did yesterday....you don't have to write this down, you just have to discuss it (.)You're sitting in a dark room over a period of time and you begin to see more detail. Explain why. Thinking about dark adaptation. Someone switches on the light, describe and explain the body's responses. ((Teacher does register)) Discuss with the person next to you ((Teacher circulates and makes sure students are on task))(1.0 min)
T: 2 more minutes
((Teacher circulates and engages with students at the front)) (1 min 09) Ok, I'm going to stop you there and we're going to do the first one first and then I'm going to give you a little more time for the second one. Just to clarify (0.7) those who go on holiday and go somewhere really, really bright and then you go inside somewhere dark like a church or a museum or somewhere like that, initially you can't see anything and then over a period of time your, what we call 'night vision' ((gestures inverted commas with fingers)) starts to develop and you can make out things a lot more clearly with a lot more clarity. So I want to know °why does that happen? (0.7) Can someone tell me (8.6)((student puts up hand)) H?
S1: (unclear on recording)
T: Ehmmm no:oo, not necessarily
S2: (unclear)
T: Ok so what happened dur...during the light?
S2: (unclear)_
T: Correct, ok (0.7) and then when we go into the dark?
S3: (unclear)
T: Yeah (.) sort of. Right, so let's say we're in the light as S has just said very nicely <rhodopsin has broken down now to (unclear) opsin. If ALL (unclear) and it's all to be broken down what would be a problem then during a very LOW light intensity? ((0.7)
S3: It would take longer to reform back like to rhodopsin or something.
T: Ok it does, so it takes longer for rhodopsin to reform in the dark ((teacher smakes pinning gesture with his arm)). What's the significance of that C?
S3: There's less light absorbed (unclear)
T: Very good, so in low light there's not enough rhodopsin, so if there's not enough rhodopsin, what are you not going to get?(0.5)
S4: You're not going to be able to see anything?
T: Yeah, but why? (0.4) What's... not having rhodopsin ...let's try and link these ideas together ((linking gesture. He points to a student))
S5: There's no action potential (unclear)
T: ((Nodding gesture)) Lovely. No action potential is generated so you're not getting...not getting hyperpolarisation so you don't get glutamate ...not being produced so you can't see. H?
S1: (question??)
T: Rhodopsin not breaking down so that would mean that in the rods, what's not happening?
S1: Hyperpolarisation=
T: = Is hyperpolarisation occurring or not occurring if there's no rhodopsin?
S1: Not occurring
T: Not occurring

S1: yeah...not occurring, why is that? Because…?
T: So what we're saying is that rhodopsin's a chemical ((teacher gestures with hands the muscles around the eye)). In bright light what's going to happen to most of it?
S1: It's broken down=
T:= It's broken down, so the sodium channels, are they going to be closed or opened?
Several students: closed
T: Closed, ok. If you go into the dark where you now haven't got much rhodopsin(0.8) is your...and you've got low light levels ...Is there going to be enough stimulus to cause an action potential?
S1 & S5: No
T: No, so you won't get signals going to the optic nerve so effectively that's why it appears dark to you because you can't make any sense from the low light that you do get. And this is called? (3.3) ((Some students call out)) (unclear)
T: What's it called?
S1: Dark adaptation
T: Dark adaptation quite simply because you adapt to the dark. (0.4) People are not 100 percent with that, they might need?=
S3: = No, but does that mean it...this only happens when you go from a place where there's high light to ...it's not just something …exposed to very dark (unclear)...not just in the darkness
T: If you were ...if you were...no, as soon as you go from somewhere that's really light to the dark, you can't see anything and you don't have enough rhodopsin to differentiate from the really low light, over time as you get more and more rhodopsin you're more likely to get an action potential from the small amount of light you receive so therefore you begin to perceive shapes.
S3: So, is this for those unable to see?
T: No, this is everyone.
S3: Oh this is everyone.
T: Well (0.6) genetics may ... seem that some people maybe better than others but this is in all humans.
S3: Ok ((writes down notes)).
T: Does that answer your question? ((Pointing to student))...any other questions?(0.9) Alright. Next one ((teacher points to second question on whiteboard)) should be a lot more straight forward but I just want to recap from yesterday so, this person is in a room and they can make out details, then we're going to switch on the lights. I want you to discuss with the person next to you what will happen, describe (0.4), and why will that happen, explain it. So can you give me a bit of depth to your explanation, so why is this happening. You don't have to write down, just discuss it, I'll give you another 2 minutes. Off you go. ((Students discuss in pairs)) (23.7) one more minute. (5.2) ((T goes over to a pair to join their discussion

T: So what happens?
S.15 So you get rhodopsin increase and ...opsin and then there's hydrolysis of (unclear) and that leads to a negative, so there's hyperpolarisation and then (unclear)
T: What's it called?
S15: (unclear) Then link that back to what's going to happen to the eye
S5: Sir ((student calls T over))(1 min 22). This is what we did, so light passes through the ganglia bipolar all the way to the photo receptors, then once we said depolarisation triggers and goes back through the same way back through the ganglia bipolar then it goes back to mid brain or...then it gets sent to the (unclear) and brain and then bypasses (unclear) and then it comes back to the eye again and that's when the iris contracts.
T: Which muscles?
S5: Emm... the ...er…nor...the circular

T: The circular muscles contract ...contracting the pupil, ok. AND STOPPING THERE (9.2) Alright so let's start off. ((Reading from the board)) the light is switched on...the light is switched on...V, what's the first thing that happens?
S6: The light goes ... hits the retina
T: Yeah, particularly which bit?
S6: Emm, the rod cells?
T: Ok, so the light hits the rod cells, N, what happens next?
S7: (unclear)
T: Just what...what's the next step?
S7: Specifically or like...like?
T: What do you think the next step is?
S7: Ok, right, rhodopsin breaks down
T: Into?
S7: Em…retinal opsin
T: Lovely breaks down into retinal opsin, A?
S8: Optin….opsin it...er...causes a series of (unclear)reactions which result in the absorption by electrolysis of a molecule to the (unclear) gates
T: Very nice. Nice and specific, very good. Em, M, what's next?
S9: The cat ion channels close
T: Yep
S9: And the insides (unclear) are now more negative because you haven't got any positive ions flowing through
T: Very good, can you give the specific term for how the cell would be described now?
S9: Hyperpolarised
T: Very good, it will be hyperpolarised. And N, what's the result of that, after hyperpolarisation?
S10: No neurotransmitter's released causing the action potential (unclear)
T: Very good, so action potential and biploar...em...what happens...er...next
S11: (unclear) released ...em... so the cat ion channels (?) and (unclear) are open?
T: Very nice, nice and specific. Ok, what happens, we've got action potential and bipolar neuron
S11: (unclear)
T: (unclear) so we've got action potential and bipolar neuron, we're now trying to link these ideas up so what happens?
S11: (unclear)
T: Ooh, we've skipped, you're not...you're not wrong but we've skipped a little bit out
S10: (unclear)
T: Yep, very good, optic nerve, where does the optic nerve go to Y?
S12: The mid brain
T: It goes to the mid brain, B, where does it go after the mid brain?
S13: The visual cortex
T: Do we agree? Do we agree the visual cortex?
Students: no...not sure (6.3) ((talking together)).
T: I suppose there ... there are two arguments...two arguments (unclear) what would happen... if it's going to the visual cortex, what kind of process are we getting taking place? (3.2)
S?: A reaction
T: If it's going to the visual cortex?
S8: Consciously
T: Yes, so it's a conscious reaction looking at vision. If we're just talking about an autonomic response=
S8: It's a reflex
T: yes, it's a reflex, so, let's stick with the autonomic response J, so where will it go from the mid brain?
S9: Emm... em... I'm not sure

T: Not sure? Ok...what do you think, A, mid brain, from the mid brain? (5.3)
S8: (unclear)
T: So the parasympathetic neurons which will go to the=
S8: =effector?
T: The effector, so now G, we get to the effector so that will get to the ...?
S14: (unclear)
T: So what is the end...end result of this?
S14: (unclear)
T: Dilate or constrict
S14: Constrict
T: What causes it to restrict, M?
S9: (unclear)
T: Very good, it's the circular muscles and the pupils will constrict. _Autonomic or somatic response?
Several students: autonomic
T: autonomic. If I was actually seeing what was happening is that autonomic or somatic?
S?:Somatic
T: somatic. S?
S.15: Could you just explain what it does from the optic nerve.
T: So, sensory neuron from the optic nerve, goes to the mid brain, now, in this one, because it is a reflex, will it go to the higher order parts of the brain?
S.15: No
T: No, so it will go straight back out the ?(0.9)..Per....
S.15: Sorry, I don't know
T: The power sympathetic neuron relays and straight to the?
S.15: Effector
T: Effector, which in this case is the? (0.8)
Other students: circular muscles
T: Yep, circular muscles. (1.6) So the circular muscles in your pupils. (1.3) Questions? (.9)_Ok...we're ok with that but I think we might need a little bit more on that ...that final step. Right, moving on, can you write the title please, 'making sense of what you see...making sense of what we see'. Ok our success criteria for today's lesson are to distil views on the nature nurture debate on development using human and animal studies; we need to check answers for clarity, logic and relevance. (1.4). Right, I'm going to put these questions up in a second and I want you to discuss them from your notes with your partner. What I want you to check in each other's answers are the depth, logic, clarity and relevance so we've been working on these over the last couple of weeks so the depth, which means is it detailed enough? Does it go detailed enough? Are you going far enough down? The logic, does it make sense? Does it link to the answer? Is it in a clear sequence? Clarity, is it clear ...is it...are there confusing sections? And relevance, is what your ans… what you're discussing actually answering the question? Ok, so those reminders are up on the board. So talk to the person next to you , I want: what is stereoscopic vision? What helps us to see images over 30 metres? Give an example. What is the Carpenter World hypothesis? What two theories why Zulu people do not fall for the Muller- Lyer illusion? How does the Visual Cliff suggest that some innate perception depth is genetically produced? Off you go. I'm going to give you about 10 minutes.

S8: Does stereoscopic mean the same as like binocular
T: Same as? (.) Well describe in words what you think it is
S8: It's like when your eyes are ...have 2 different images, one from each eye and you put them together to give you like a distance and perception
T: Well, if you think about the root of the word 'stereo' and 'binocular' they both mean ...so stereo's having two ...two

comparing inputs and binocular so...you have two images come together.

(T circulating).
T to me: So this section the're doing now is just fact based em...so it's not ...the bit they were just coverng that's the much more sort of conceptually difficult whereas this is just a bit of a sort of abstract application of it and then it's going to feed into next period, they're going to do about ...it's a bit more conceptal, actually about how sort of neurologically does vision develop.

((T circulating))
((Students use a ruler to measure the two lines from the Muller-Lyer illusion and are astonished to see that both lines are the same)).
T: So why is it that this one appears bigger than this one, even through they are the same size?
S10: Because they (unclear)the perception of depth in the brain
T: So what part of your brain is responsible for that?
S10 The higher brain?
T: Can you be more specific? Can you be more specific? What part of our higher brain deals with =
S.10: = the visual cortex
T: The visual cortex. And what part lobe is that in?
S.10: Okk...ox
T: Occipital lobe, yes. Ok
S.10 How do you say it?
T: 'Occipital'
S10: Occipital.
T: Why...why do you think for ...for humans, this perception of depth, even though it's wrong here, why is it so important to us
S.10: Oh, it's meant to be important?
S8 I read, I read about it, apparently all (unclear) when we were hunters (unclear) in prehistoric times
T: Yes, sort of...sort of… if you look at this one here which is bigger?
S8: The elephant
T: Right, but if you were to see that which is bigger, the elephant or the antelope?
S.10: Antelope
S9: The elephant would be bigger
T: Right whi is...in terms of evolution, why is it important to have that ability to differentiate by distance
S.8: Oh, because does bigger mean a bigger threat so if something is further away if it's smaller then it's less of a threat than something that's closer to you.
T: True, but I just mean, practically why is it ...what's the distance from which you can properly tell perception?
S8: 30 metres
T: 30 metres, so why is it useful to hava this like this adaptation where you perceive things that you cannot actually see? (3.6) Ok, what would happen if you couldn't?
S.8: Then everything would look the same ...same thing
T: Yeah. So you're not going to be able to tell how fa...if you've got to get to somewhere, you're not going to be able to tell how far it is, you can't tell how big an animal is
S9: Is it because light can't get in?
T: No, it's not about light not getting in, it's about how your brain perceives it.
S9: it's really weird, sir. So you're saying that it's based on past experiences
T: So why is it ...so which one do you perceive to be bigger?
S9: This one?
T: And so what's actually causing that perception?
S9: (unclear)

T: Why is that useful to us?
S9; So we can compare
T: Why do we need...why do we use visual cues to perceive depth rather actually to see it?
S11: You need to know how far away things are so that you can...
T: And up to what distance can you actually tell how big things are?
S.11 30
T: So we need to be able quite often to see beyond that so therefore...
S.11: we use depth and perception to work out beyond that

((T circulates)) OK I'M GOING TO STOP YOU THERE. We'll just do one and two. So this is all about, about vision but we're moving on from what we've been doing which is the fundamental neurology of how we see in terms of cells and chemicals down to something much more complex which is how our brain is processing and perceiving and adapting which is something very, very different. So, first of all, what is stereoscopic vision?
S8: It's when an image is provided by em...both of your eyes and your brain processes both images to give you a sense of perception.
T: Yep...up to what distance?
S8: Up to 30 metres
T: Up to 30 metres, so what we're saying is that if you had something in front of you, your left eye, and your right have 2 different angles so therefore, when you want to reach it you know where it is in your field of vision so you can grasp it and move it. What is the significance of this ability? (0.7) What's the significance of having this sem…stereoscopic vision? (1.3)
S15: You'll be able to see with precision where an object is so...yeah
T: And why...why would that be useful?
S15: So that you can pick stuff up
T: Yeah, very good, so it allows you to see things but this is only up to 30 metres we have this stereoscopic vision. So what helps us to see things over 30 metres away, so, to put it into perspective, you're talking about the cars over there or the other buildings or the pagoda. What helps us to allow us....helps us to see images over 30 metres away where we don't have this stereoscopic vision?(2.8)
S6: Past memory
T: Past...past memory R?
S13: Is it because the image from the retina on both eyes are really similar to each other and so...like...em...could you use past experience to use to ...em... interpret the image?
T: Yeah, very good. Ok, so, from your life you have used previous things so, for example, what...can someone give me an example of a visual cue particularly of depth?
S5: Buildings
T: Buildings, and what happens to them?
S5: So the further away you get the smaller they look
T: yes, very good. Things look a lot smaller, if you ask a child if they see something very far away they will assume it is small, because it's logical, the image is smaller. But we know, because we've walked up to things lots of times, as you approach something it gets bigger. So we can use that as a visual cue. What about in terms of lines, what visual cues do we have in terms of lines? S?
S10: The lines could be merged together which then you can create an impression of how far away you are from that
T: Lovely. Ok, so here, as you get something doing this, going away from you ((teacher draws lines on on board)) you're assuming that they are...? (.7) Equally spaced distance so you know how far you've got to go, ok? So this is from our previous experience. Ok, what about the other two? What is the Carpenter world hypothesis? What are the two theories why the Zulu people do <u>not</u> fall for the illusions in your books and for the examples I'll put up on the

screen, so for example, so for illusions like this. Ok? We'll do this one in a second. ((Students discuss in pairs)) (20).

T: So what...so if you ...<were saying there like the Carpentered world they use straight lines and angles, what's the logic for why they'll have a different perception of depth?
S12: (unclear)
T: So what is about straight lines that leads us to have different perceptions of depth? (6.4) So for example, if you've got ...this is your street... what would you perceive to be happening... this is your house... what do you perceive to be happening along here?
S12: it's a straight road
T: It's a straight road, so what do you perceive about the distance ...can you perceive distance between here and here?
S12: It's the same
T: So are these houses smaller than this house?
S10: The same size
T: But can you see that that's based on these right angles and straight lines that give you that feeling of depth because if the houses are all round you don't get that perception.

T: ((to student S13)) they can but what we're saying is that they have, although I'm not saying that obviously they won't be able to perceive the street that's going further away but these optical illusions they tend not to fall for them, to them they can...can see it as obvious because they don't have this in built perception from living in a right angled...where most things are set at right angles.
S13: It's like in the countryside where they wouldn't see that
T: In the UK? So you think the gates and houses and all the roads and everything are still set on those angles?
S12: So do you think it's to do with their houses, and how they see things with...how they perceive things, because when
T: We all see the same thing but it's how=
S12: =interpretation and how we make sense of it

T: ALRIGHT, AND STOPPING THERE. So, T can you tell me what is the Carpentered world hypothesis? Not sure? Ok, someone else?
S4: When you live in world made of straight lines
T: And so what's the significance of that?
S4: It gives you better depth perception
T: It gives us better depth perception? Why does it happen, why is it...what's the logic behind why a world with right angles will give a... different depth perception S?
S10: (unclear) right angles and straight lines ...you're familiar with (unclear) so if you go (unclear) you're gonna em...interpret images with the same similarities so with acute angles and straight lines.
T: Yeah, very good, exactly, so as we talked before about vanishing points and very straight roads that go to a definite point that is your perception of depth, that is what you have experienced so that is why it's logical for you if you're given the same scenario to use the same perception. So why did they say that the Zulu people will not fall for these types of illusion...where you're using right angles? L?
S14: Because the live...not necessarily in forests and stuff but they not surrounded by things in straight lines and right angles such as buildings, so they've grown up to ...in a circular world
T: Ok, and so how does that ...so can we clarify that...how does that change their perception?
S?: (unclear as bell ringing) so if you have someone living in a carpentered world and a world made up of circles or something (unclear)

T: Are we saying the Zulus don't have depth perception?
S14: No
T: No, it is just ...different because they live in a world where there is depth, so they will still have that but they do have a different depth perception and not based on right angles. Emm…ok last one. How does the visual...virtual cliff suggest some innate perception of depth is produced genetically? N?
S9: Is it because...linked to that experiment where babies are put on a (unclear) it's like they know that it drops so the fact that they stop shows that because they are inexperienced ...there must be some genetic reason why they do it.
T: Very good, yeah. If you show them a virtual cliff -not a real one, even before they have perceived depth perception, they will be hesitant to move across it. Although babies only crawl at 6 months so maybe they have…How did scientists further support this argument?
S10:They did it with animals
T: They did it with animals, what's the significance of that? Why would animals be useful, thinking about babies only crawling at 6 months?
S10: they can start moving earlier
T: So what's the logic for why that helps us support the argument?
S10: to help show that they stop when they haven't developed depth perception
T: So therefore...?
S10: To show that it's innate
T: Very good some innate idea that 'I don't want to fall down the drop' even before you've had the ability to build up this depth perception.

End of recording

Appendix O: J. 25.4.13

Lesson observation 2 transcript.

((Students arrive))

T: What we're going to look at today...This is not new... it's just ...I've been working on some stuff and it's just a slightly different way of looking at our ...em... revision. So, from yesterday you should have looked at a past paper … and you should have identified some areas that you ...you specifically need to work on today so we're going to be using something called the ...I guess the CRAE method, it's probably the easiest way it's pronounced, to...as an efficient way of revising that particular section...The success criteria is to have identified areas of weakness, which we've already done, to...to review the section to develop comprehension, recall and application. And to evaluate the effectiveness of the revision session and decide next steps.
((Teacher checks with students if they have identified an area for revision))
T: So, you're going to work through your identified area, you're going to work through these steps and this is what we call hierarchical... you're going to work through some hierarchical thinking. ((Teacher draws up stool and sits at the board)). There is no point in trying to apply something if you do not understand it, if your foundation is not effective. So the first bit we're going to do today is comprehension. So working through that area (.7) do you understand it? Ok, so I'm going to break this down a bit for you, so we're going to spend some time on comprehension (.6) then you're going to work on recall because in the exam you don't have your notes on you, so can you (.7) recall it? Then apply it so you should all have individual past questions for the section you're going to do, and at the end of the lesson we're going to evaluate it and say, well, right, having done that?,Was your revision...your recall and comprehension effective so you could apply it or do you need to go back to revisit it? So these are the steps for today. I think we'll probably have 20 minutes ((gesturing pointing to the sections on the board)) (1.2) No... sorry...about 25, 25, 25 , then about 10 minutes at the end (pointing to each section separately). Ok? Questions? (1.2) Alright, so, first one what we'll be looking at is comprehension. So, I want you to actively review this area , making sure you understand the key concepts and key words. Now some things are more difficult for comprehension. So, if you're going to be looking at ...em... chemiosmotic pathway in respiration, that's quite difficult to understand .Some bits are more...just recall so it's just about do you understand a lot of the key words. So, you've got until ... quarter past ...twenty past to work through your section. So, make sure you understand it? Do you know what the key words mean? And can you explain with clarity why the process happens? So,in other words, is it clear when you're explaining what you're talking about? Er...and so, we want to know why as well as not just what happens… You can use either myself, another pupil, textbooks ...em to consolidate your understanding. So what we want here is to check your ...do you really understand this bit? That's enough talking from me

((Students released)).

((Teacher explains to another teacher supporting in the lesson))
T: Yesterday they went through their June 10 unit 5 paper and so they identified areas and they should have all already brought in

past paper questions for their individual work. ((Teacher approaches pair to check they have identified an area))

T: A, which bit are you looking at?

S1: Muscle...basically the thing for (0.8) how a muscle contracts

S2: The theory

T: Ah, the (sliding filament) theory? Ok

S3: I'm doing hydrogen ions,their role in electro (unclear) hypothesis...and action potential. It's in the textbook and it seems like...like another section?
T: Ok, do you want me to go through that?

S3: Yes please

T: Ok,I'll have a quick whip round and I'll get back to you.

S4: Sir, you know how they mention that the heart's (unclear) regenerate?

T: Yeah

S4: And you know how they go on about the SAN mode and the=

S5: =is that linked to nervous system in a way?

T: ((grimace))

S5:↑Even though it's part=
T:= Myogenic means it's self stimulating but the cardiac centre can alter the rate of stimulation (1.2). Do you understand what I mean? So, if you cut someone open and rip the heart out it will continue to beat without the brain.
S4: That was my problem
T: That's myogenic
S5: So when you do exercise?
T: It..it will respond to changing stimulus
S5: Ok
T:↑OK

T: ((to another student)) Which bit are you looking at?
S6: Em...I don't know yet, sir, I'm a bit iffy
T: How about ...if you're not sure then I would start with your spec, go through your spec, re-traffic light it from all the work you've done and say which bits now are my biggest reds or which bit is amber and I just want to convert it to a green? ((Teacher puts specifications up on Interactive Whiteboard for students to refer to))(09 mins 55.5) ((student scrolling through sections of specifications as part of the exchange. Teacher moves to another student))
S7: All the green stuff basically, then nervous stuff=

T: = Action potential

((Teacher gets copies of textbooks for students to consult with)). (13 mins 45:7 ((Teacher goes back to the group including S3 to support))

T: Which bit are you looking at today?

S11: Sliding filament theory, well, you know the bit when the heads bind to the active site (1.2)

T: Yeah so when the heads bind to the=

S11: = Actin filament?
T: Yeah

S11: Yeah

T: So the myosin combining site=

S11: =Does the ATP break down (0.6) into? =

T: = No, it binds and it moves and the ATP binds to release it and then it's hydrolysed to (.) ratchet it back.

S11: Hydrolysed means?

T: To break down

S11: To break down ...the ATP?

T: Yeah

S11: Ahh, because you need it to move back =

T=Yeah it's the=

S11=Do you need it to move forward?

T: Because it's...em... because it's like cocking a gun so the ATP is hydrolysed and moves the heads backwards so that in a primed position they bind, ratchet forward using the energy from the hydrolysis of ATP=

S11= And that's when it hydrolyses...when it's going back

T: When it's going back, yeah.

S11:I see...but here ((refers to a textbook)it says ATP is released when it forms a (cross bridge) (1.13)

T: ((Reads out from textbook)) "Myocin heads bind with myocin binding site" (inaudible) (1.6) Yeah ((cough)) because it's hydrolysed but it's still attached to the head then when it binds to the binding site the ADP and PI are released, head moves forward, new ATP attaches, is hydrolysed, moves backwards but the ADP and PI are not released until it moves backwards.

S11: Ahh, I see

T: Ok?

S3: Yeah

T: Is that what you're both looking at today?

S8: I'm looking at the eye

T: Ok, the structure of the eye? Retina?

S8: No, the light and dark adaptation

S9:: Sir, you wouldn't by chance have that Clegg book? ((Teacher indicates pile of books at the front. Moves to another pair of students)).

T: Which bit are you looking at today?

S10: This bit

T: Resting potential and action potential?

T:((talking to me to explain the context of the lesson)) So they had a single lesson yesterday and they had a …they completed a past paper for homework so they went through it and sort of discussing with a partner...sort of working out what were the areas where they were still losing marks. So. for today they had to pick an individual area and bring an individual past paper em… which I find quite useful because it means that they're not...you're not doing generic revision and they've got a specific bit for the exam...

((Teacher goes back to the group including S3 to support)

T: So which bit you want to do? First of all which bit of ... what type of respiration is it if we're talking about the chemiosmotic pathway?

S3: Aerobic?

T: So what's the bit before that?

S4: Kreb cycle?

T: Yeah what's called Krebs?

S3: Like the (unclear)

T: And?

S3: The link reaction

T: Ok, so what are the products coming out of all of those?

S3: ATP, NAD, FAD, H+?, CO2

T: What kind of NAD?

S3: Reduced

T: Very good

S3: NAD H? Is that one? ((Teacher writing out formula on board))

T: What is the term we use to show that this is produced not in the chemiosmotic pathway?

S3: These ATPs ((pointing to the board))

T: These ATPs that are produced in glycolysis and the link reaction and Krebs

S3: Oh phospheration↑

T: Yeah so substrait level phospheration subjection of ATP. Alright, so, we can forget about this and we're going to take these two, ok, into the mitochondrion so first of all, so we've got our ...our matrix inside the mitochondrion, the inner membrane and then the ... so this is the inner membrane and then this is the intermembrane space ((teacher drawing diagram on board)). So we would have another membrane and then cytoplasm.

S3: Ok?

T: Happy with that?

S3: Yep

T: Ok, so we've got what within the membrane?

S3: Electron (unclear)

T: Yep, ok

S3: And that's a stored particle (unclear)

T: Very good, linking it back to unit 1, what do we called proteins that go across the (unclear) membrane?

S3: Em… No...not that one.

T: Trans?

S3: Trans

T: Trans-membrane protein. So this is the trans-membrane protein and this is the…

S3: Particle

T: And what does it have within it? What's its function?

S3: Is it ...don't hydrogen ions go down it?

T: Yeah

S3: Does that mean that it's already got hydrogen ...oxygen because it's water?

T: Mm not quite… what's its function? The main function of it?(0.9) Not sure? What's the main function of chemiosmotic pathway?

S3: Not sure.

T: Ok, these leave, and then when they arrive here, what happens? ((using diagram on board))

S3: They release hydrogen?

T: Very good, ok. So, what's the term we can use if they've lost hydrogen? They have been…?

S3: Oxidised

T: Oxidised, so therefore the electron carriers have been…?

S3: Reduced

T: Reduced. So just like in photosynthesis ... H+ goes down the electron transport chain losing energy. This is used to ... not sure?

S3: Take the hydrogen ions up?

T: Very good. Ok H+ ions into the inter membrane space. So=

S3= You've lost a hydrogen, where's that gone, down here?

T: So these will go, so into here and then moved down and get pumped up, here, it will be a lot more complicated than that. All we need to know=

S3= So the arrow here is showing the movement up the hydrogen ion ?

T: So as these...so as these electrons move down, the electron carrier system it is used to pump the hydrogen.

S3: So, if you haven't got electrons moving, you can't move the hydrogens up (unclear) because there's no energy being produced

T: No, and also you can't have H+ ions without spare electrons because the electrons would be disassociated from it.

T: So we have electrons moving down, hydrogen ions are being pumped up so this means this has a...

S3: high concentration here.

T: high concentration, here ...Happy with that?

S3: Yep

T: So what happens next?

S3: It moves down

T: It?

S3: H+ moves down the concentration gradient

T: Through the?

S3: Stalk particle

T: Ok, so ((teacher draws)) inside here we're going to have what molecule?(1.2) What's catalysing this reaction?

S3: ATP?

T: Very good ((teacher writes on diagram))ok, so this is a little bit more information than we need but it can be on the mark scheme. So what molecules do we need to make ATP?

S3: ADP and PI(unclear)

T: Very good...so this enzyme has what is called a secondary active site, what molecule does it need in order to become active?

S2: Secondary messenger ...no, not that, that's the wrong thing.

T: Well, it's like a secondary messenger ... what's going to fit into the back here that's going to allow this to work?

S3: ATP and =

S2:= what are you talking about?

S3: No because the ATP and (unclear) and the ATP and PI go on the other side

S2: So H+ is kind of like the secondary messenger

T: It is

S3: Oh ok

T: It's what we call a co-enzyme so it requires this ((points to diagram on board)) in order to open the active site, that means these can go in and bind ((points to diagram)) (0.9) ATP can be formed ↓

S3: And so the H+...?

T: As soon as the reaction ... it moves out and passes back down. So... at a lower level we say the hydrogen rushing through makes the enzyme work, what we actually know is that it's the H+ interacting with the enzymes that allows (.) this reaction to occur. Ok?

S3: Ok

T: So now we have H+ ions they meet up with...? (5.0)((Teacher writes on diagram))

S2 & S3: Oxygen?

T: And?

S3: Electrons? (3.7) ((teacher draws on diagram))

T: Very good...so you end up with 2 e-, 2 H+ is equal to ?

S3: H2O

S2: So has...the electrons there, they've come from the (carrying)

T: Correct...electrons and hydrogen...Happy?

S2: So then, what's this?

S3: That's just more detail of that page

S2: Of the same page?

S3: Basically, you know they explain it on this diagram, that's like the brief version=

T:= and then they explain it in words, so you're talking about the chemiosmatic electrochemical gradient so that it's very positive here and a concentr...a high concentration of hydrogen so therefore there's a large gradient for it to rush down.

S2: Ok

S3: So you know that ((student pointing at board)) that ATP, is that oxidated phosphorelation?

T: Is this...all of this ...all of this is ...er...what we call oxidated phosphorelation.

S3: Ok

S2: Simple!

T: Ok? So ...I would may be get this as a flow diagram and then also have the bullet points.

((Teacher moves to another group))

S4: I need your help, sir. You know here, yeah ((points to notes)) does it ...how do you explain it when it goes to the next bit like when it spreads (1.8)

T: Ok, have you got some paper? (4.2). So, easiest way...they show it like this but the easy way to think about it is how it really is in the neuron which is that you have (0.9) what do we call the gaps in the myelin sheath?

S4: Er...nodes

T: Of?

S4: Ranvier

T: yeah...of Ranvier, very good. Ok, so I think it's actually easier to think about it like this ((teacher draws diagram))

S4: Go to page 12 (2.4)

T: Ok, so you've got these exposed parts of the membrane but...at the nodes... excuse me...the nodes are exposed so therefore where the myelin sheath is it is...em…insulated so you cannot get any electrical changes so what would happen...so impulse arrives here ((points to diagram)) what's going to happen here?

S4: (unclear)

T: So what's going to go where?

S4: Sodium ions go in

T: Ok, so NA in. So then what will that make temporarily the inside?

S5: It will become positive

T: And make the outside?

S5: Negative

T: Ok. If this one's originally at its original state, what's the charge going to be on the inside?

S4: Minus 7

T: Yeah, and this side? ((pointing to diagram))

S4: Positive

T: Yeah, it will be positive. So now what we've got is a difference in charge and this works just like an electrical circuit so what do you get if you have differences in charge? (6.1) Not sure? Ok, so you get localised currents (.8) set up so some of the negative charge moves to the positive, yeah? So the negative charge moves here. If negative charge's moving away, is this going to become more negative or more positive?

S4: Postive

T: Ok, on a graph, what happens if the inside starts to become more positive?

S4: (unclear)

T: So, if this low (unclear) current is enough we get... an action potential in the next section ...and that's how ... this is called what kind of conductivity?

S4: Salvatory?

T: Very good, salvatory conductivity. So this allows them to jump from node to node

S5: So here it talks about NA ions moving to rest in (unclear) is this what it is?

T: Yeah, so NA ions, the positives as they rush in will start to migrate to here ((points to diagram)) because of an electrochemical difference so that they will migrate to there causing depolarisation therefore it...ok?

(18 mins 28.5) ((camera moved to capture teacher supporting group discussion and other pairs/ groups working independently))

T: OK AND STOP, ok, I'm not going to rush you because like I said there is no point in going to recall if you don't understand it. However, a lot of you now should be getting to the point where you're ready to now start testing your recall. This is a ...is a skill in itself, ok, because when we go into the exam, we have to have the ability to (.4) recall that information accurately, ok? So, what I want you to do is, if you're fairly happy with it, you can understand the concept, now let's work on recall. So, either ((pointing to the boards at the front of the room)) big boards, flash cards, I don't mind how you do it, I want you to distil that section into what the key things you have to bring into the exam in your mind. Ok, check it has the depth, have you put enough of the detail in, in terms of biology we're talking about, all of the specific terms, have you explained it at an A2 level? Also, does it have the breadth? That means have you covered all of the necessary points that you'll need in order to get the marks if they ask you a long answer question? Ok? So, check for those two, then once you've got it distilled you should now be someone to... test you, so I've put there ((points to the board)) as 'look/cover/ recall' so look at it, cover , get someone to test you, can you recall it. Actually saying it without the information in front of you helps ((gesture of mind working)) to reinforce those neuronal pathways in our brain so it becomes a pattern, then a memory. So that's how neurologically you learn. So, if you're still on comprehension, that's fine, if not I want you to work on recall. And I'm probably going to give you now...probably until about 20 to...so you've got 20 minutes, ok? ((Students released to work in their own)).

T: ((to student)) Are you on 'apply'?

S6: Sir?

T: Are you on 'apply'?

S6: Yeah, because I'm doing this ECG ratio so I can't really revise...

T: Ok

S6: So I need to practise it

T: Ok because, yep, your recall is pretty good anyway so that's fine (.8) So you might want to have a go and then or...or...you might want to have more past paper questions because for you...I think your emphasis is much more on the...application stages.

S6: Sir, can I ask what the difference is in referring to ...(1.2) T cells and lymphocytes is the same thing, isn't it? Sometimes in the exam paper it says it wants T cells and sometimes it wants T lymphocytes.

T: I think it's just a more specific way of saying it

S6: Yeah

T: I would say lymphocytes, so T lymphocytes

((Teacher circulating. Students working in pairs, groups)).

T: ((To student)) (Unclear) synapses or just this last bit?

S7: This last bit.

T: so, in order to get a ... in order to get an action potential in a post synaptic membrane what has to happen?

S7 Err... (7.4) a threshold has to happen

T: Ok...so how do we get a threshold in this membrane here? What causes the action potential here?

S8: A neurotransmitter?

T: A neurotransmitter, right. So if all this neurotransmitter got released and nothing happened what would happen in this post-synaptic membrane?

S8: (5.5) If?

T: If a neurotransmitter was... if you released it, so action has arrived, a neurotransmitter released (unclear))but then it just stayed in the synaptic cleft what would happen?

S7: Then there wouldn't be (unclear)

T: Ok, alright, ok so let’s it stay there and it’s binding to the receptors, what would happen then? (6.7)

S6: The response (unclear) would happen

T: The response (unclear) would happen so what would you get lots of in the postsynaptic membrane?

S6: Neurotransmitters

T: Yeah, lots of neurotransmitters, and if you have lots of neurotransmitters you're going to get lots of…?

S6: Action potential

T: Action potentials. Ok, so let's put it into a context, so...let's say it's a pain response, so you put your finger on a pin (0.7) you get the pain signal and it gets to this synapse here ((points to a diagram)) neurotransmitters are released and so what are you going to get in this membrane?

S6: Action potential

T: Action potential. Right, so you take your hand off. If those neurotransmitters were still there ... what would happen?

So your hand is now off the pin, but what would happen?

S6: It still hurts

T: Yeah, the pain would still be there because you'd get this continual stimulation ...what this last section here is saying, once an action potential arrived and the neurotransmitters are being

released, they have to be removed from the synaptic cleft to stop them continually stimulating the membrane. So, there's different pathways: either they can be broken...taken up and broken down here and then they're broken down into two different bits and that can be released or they're taken back up by the pre-synaptic membrane or just destroyed...or just broken down into in the synaptic cleft.(1.2) Ok? ((Teacher moves on to other students))

S2: What's the funny shaped thing?

T: What, this bit?

S2: Yeah

T: This is an enzyme ...so this is an enzyme, so this is an active site and this is...the proper name is called an allosteric site or secondary active site.

S3: It's not easy to remember. ((Teacher moves to another student))

S9: Sir, I'm not sure about the action potential...the stages like

T: On this? ((pointing towards diagrams students have started drawing on their whiteboards))

S9: Yeah

T: Ok, so why don't you run me through it and I'll correct you

S9: So resting potential is at minus 70, so that's when the potassium ions leave and inside's negative and outside's positive and it's balanced, there's no net movement of...any ions or potassium ions is balanced, sodium ions can't move and when the threshold level's reached ...above threshold there…the electrical impulse goes=

T: = Ok, stopping there. So, when you say threshold what is threshold? What's happening?

S10: An electrical impulse...it's a neurotransmitter

T: Ok and how do we, if we got to here ((pointing at diagram)) so, as you said, we're at minus 70, so, on...in the membrane what have we mainly got on the inside?

S9: Negative…no K plus

T: Yeah, and on the outside?

S9: Emm, is it NA? (1.2)

T: Ok, so minus....positive...alright ((teacher draws on diagram))So, you were talking here, what's happening?

S10: Increase in electrical activity

T: Yeah, and so what's happening in terms of the membrane?

S9: Is it becoming more positive now?

T: It's becoming more positive, yeah, why?

S9: It's because (3.1) emm…this is going to give you (unclear)inside

T: Yeah, and so what's actually happening in terms of ions?

S10: Is there more NA moving in?

T: Very good↑ So ... some NA is going to move in ((teacher draws on board)) so this is...let's say this is minus 70 let's say it becomes minus 60. What do we call this process?

S10: Em... depolarisation

T: Very nice. Ok...continues to go up ((teacher adds to diagram)) as you said, when it hits ... a certain point let's say minus 50, that is called…?

S9: Emmm... minus 50...oh is it (1.3)

T: It's what you were talking about before (1.4) So we've got a certain amount of depolarisation...when it hits a certain level ...what's that called? A level before an action potential can happen?

S9: A level before an action potential ...oh threshold.

T: Yeah, ok, so let's say now that it gets to minus 50, so what happens next?

S10: Is it the voltage depended on sodium and channels open up and more sodium moves in

T: Yeah, very good.

S10: So the inside becoming more positive and so that is minus...I mean plus 40

T: Very good...so what do we call this whole...this response with threshold?

S10: The whole thing?

T: There's a specific term we can add in here about the fact that if...you don't get to threshold nothing happens, as soon as you get to threshold it...it all goes all the way through (.9) A something and something response. (3.6)

S10: I can't think

T: No? All or nothing

S10: Oh yeah

T: So all or nothing, so once you get above threshold it will go through the full action potential, you cannot stop it. It's like pulling a trigger on a gun, once you've pulled the trigger=

S10; =Yeah, it will carry on

T: Ok? So what happens next? Then we're up to here ((points to board))

S9: Over there the sodium channel closes and then the potassium channels open up, and then it decreases depolarisation, I mean repolarisation takes place where the potassium pumped=

T: =Pumped?

S9: out

T: is it pumped?

S9: Oh, it's sodium

T: I agree with the ion, what method of transport?

S10: Oh, electrical gradient is it, no?

T: Yeah, electrical gradient so therefore what kind of movement is it?

S9: Diffusion

T: Very good. Inside's becoming?

S10: Negative again

T: Ok. What happens next?

S10: It goes below em...resting level which is hyperpolarisation.

T: Ok, why does this occur?

S10: It's because potassium is constantly being pumped out and more than the level of resting potential which means it goes below (unclear)

T: Very good. What is the significance of it being below at resting negativity? In terms of the neuron, why does it need it after an action potential to become mo... hyperpolarised?

S10: To conduct more (unclear)

T: The opposite ...so it prevents the action potential [going=

S10: = going] backwards. Can it go backwards?

T: No, it can't because here it cannot be stimulated so when the next bit of the neuron is depolarising it cannot stimulate ... the bit behind it.

S10: Oh, ok

T: So what do we call these bits?

S10: Refract...refract

T: That's in, say it, say it

S10: Refractory something

T: You've got it, refractory period. Absolute refractory period, relative refractory period, cannot be stimulated, is more difficult to be stimulated. How does it get... what's happening in terms of ions as it goes back towards minus 70 ?

S9: Is it back to resting potential, balanced non net movement.

T: Mmm but something's got to be moving if it's going back towards minus 70

S9: More sodium entering in

T: Sodium?

S9: Oh, potassium ...makes it positive slightly but=

T: =Some potassium moving slightly back in to get it back to minus 70. Now let's see if you can put that discussion into bullet pointed words here.

((Teacher moves off and checks notes written by 2 students))

T: Good answer

((student on camera, being tested by another student, asks probing questions to check precision of understanding. Students are drawing on different modes to demonstrate recall: e.g boards; oral Q&A))

((T approaches boys having the extended discussion on camera))

S11: Sir, what's MRI?

T: What happens in an MRI, why is an MRI different to other scanners?

S11: Because it uses radio waves (unclear)

T: Yep, and what's the fundamental difference between what you can do with an MRI that you can't do with a CT scanner?

S12: It's more accurate, and you can slice it, and it's over a period of time

T: You can slice with a CT scanner as well.

S12: Is it not over a period of time?

T: Emm... what does CT use?

S11: X-ray

T: X-ray, what do...do X -ray pass through bone easily?

S11: So bone,so x ray produce images of bone but MRI can only do tissue

T: Very good, so it does soft tissue. Ok, so the benefit is that it does soft tissue as well as em...as well as bone. MRI, what molecule does it target?

S11: Hydrogen nuclei

T: Yeah, it affects hydrogen nuclei

S12: Deoxy...haemoglobin

T: Yeah, deoxyhaemoglobin, in an FMRI scanner you can (.) put someone in there, and then you can look at the levels of …

S12: Deoxyhaemoglobin

T: And what does deoxyhaemoglobin, if there are high levels of that, what does that tell you is happening?

S11: More oxygen is being used

T: So, therefore,

S11: It's becoming deoxy=

T: And why would you be using up oxygen?

S11: Because that's the active area of the brain, that's the bit that's being used

T: Ah, very good, because if you're using up oxygen then what process is occurring?

S12: Respiration

T: Respiration, all right, so that means you can put someone in and you can view it in real time. CT does a snap shot, so let's say you take somebody and you want to find out what parts of the brain to do with certain movements you can put them in an MRI scanner and then say 'can you solve this puzzle'? Or can you catch a ball _ or even imagine catching a ball, and the parts of the brain that would do the catching will fire up.

S12: But sir, you wouldn't be able to do movements in there, would you?

T: You can have simple stuff with you, like you can do knitting and things like that, but not big movements because you're concealed. But you can do things like playing chess and things like that.

S12: Oh really↑

T: As long as it's not made out of metal

S12: Oh yeah, of course.

T: So, it's a bit more useful for us in terms of live ...looking at how the brain responds to different things.

S11: But why would you even do it, MRI, I mean

T: Let's say you're a psychologist and you want to look at drug addiction or the response of people to advertising so you can put someone in an MRI scanner and show them images and you can see which parts of their brain are working and therefore see how it affects them…because we know how human responds but we don't really know sometimes why, so if we understand why and which part of the brain then we can potentially use that to help them or target drugs or target treatment.

End of recording.

Appendix P: J. 9.5.13

Lesson observation 3 transcript

J: Ventilation questions out please. If you haven't got ventilation ((Teacher gives out papers to anyone without ventilation questions. Teacher organizes class)).

J: The first thing I want you to do because there were some definite areas of where people were not sure we said the starter would be just to carry on and have a bit more of a discussion in groups. So the first bit is to go back through the questions and work out (.) are you clear on the subject knowledge as in do you actually understand like how the Spiro meter works and the control of ventilation and just the core content. But also, what exam techniques have you learnt? And these are specific to ventilation questions so they're not like your >standard exam technique of bullet pointing answers and putting key words and all that stuff< like some of you when we were talking about of having to do the average for...em...a ventilation rate, knowing that you have to go from the peak to the bottom. So from these, what specific ventilation techniques have you picked up so you know how to use those when... when you come across them again. So, about 15 minutes, so if you can just make a note and just do a quick evaluation of...ok, right, what am I clear on? What techniques have I learnt? Off you go.
((Teacher does register, then circulates around the class)).

T: ((To student)) That ((points to board)) doesn’t mean I want you to write out everything you know it's like (.) review it yourself and exactly identify, alright, these are the bits that I think I still need to look over.
S1: ((Teacher approaches student)) Sir, we were just saying like you know like these key terms, it comes up quite a lot, so it's good to make a list of all these=
T:= Definitely, definitely because they sound quite similar but they mean very different things, so if you need to...if that's an area you need to know like what's the definition.((T moves to boys who came in late))
T: Ok, so, going through these ((points to the question paper)) I want you to identify what...which bits of subject knowledge are you clear with, which bits you're not, and generally your subject knowledge is quite strong, so for you it might be more of a focus about the specific techniques about how to answer these questions. So maybe review it and go, well, actually, now I know when I come across this, these are the steps I have to take.
S2: Sir, what were you talking about yesterday when you had to draw two lines of best fit and then work it out?
J: So, for...let's say for example if they want (0.9) so I think you...so you can use this one bit I think (.) looking at how the mark scheme's going I think they actually want you to do...to not...taking an average is not giving a precise enough answer, so I think it is better to use the one when you're counting them all and averaging them. Because the only time you... other...other than that they would ask you for a single time point so at 20 seconds, and then from then you just do a measure from that to that, so I would ignore that method.
T: ((To another pair)). So for whatever section you want to work on today focus on your comprehension. So, grab a board, and you've got about 20 minutes for comprehension. If you think you get it quicker, then move onto recall.

T: What are you working on today?
S3: Synapses(.4) because that seems to me that they can give you like 4 or 5 marks but in a context (.) so like they'll give you acetylcholine and they'll ask you how it is transmitted to give you an action potential ...and I did that question and I got like 2 out of 5 because I looked at the mark scheme, and they really want you to say pre-synapses=
T= Yeah, yeah it's very, very specific, I agree
S3: So if you say it just binds the receptor, they only give you a mark because you're not saying which membrane is=
T=Yeah yeah, yeah for sure, for sure.

S4: ((Refers to a question on using data to compare breathing patterns before and after exercise)). On this question here about before and after, I wrote that after exercise the person's breathing became much deeper and faster.
T: Much deeper? I think you probably need to be more specific
S4: So the breathing increased
T: Well that's different so breathing rate and deeper
S4 (Unclear) I put that before exercise the rate was 20.66 and after exercise this was doubled
T: So I think you've got two marks there
S4: Because here I said (unclear) increases but within that (unclear)
T: I think you've got 2 but I think you haven't said the rate of breathing increases, you've said it implicitly
S4: You have to be clear
T: Yeah, because you've got to use the technical terms, so how do you put that as a technical term?
S4: So, the rate of breathing increased after exercise

T: ALL RIGHT, STOPPING THERE. So today, we're going to use the CRAE method that we used before. So you're going to identify an area, you're going to review it for comprehension and recall and application, and then at the end of the lesson evaluate it to see if you have completed that section. Now all of you yesterday were asked to identify a section which you should ... so you should have brought that with you and have some past paper questions for your application section. So when you're ready from ventilation work on your comprehension, so review it, using active revision, make sure you understand the key concepts, can you explain it with clarity? So really clearly, using proper key terms, get someone to check so ay it out loud and check that your explanation is clear and that your written explanation is clear because that's what you're being examined on.((Students then go back to working independently))

S5: Sir, can you go over the pupil reflex and how it involves photoreceptors because I have an exam question but I don't really know what they're talking about.
T: It doesn't help in the book that they have it in all different places, so they are all interlinked. The first thing, pupil reflex is it an autonomic or somatic response?
S5: Autonomic
T: An autonomic response, ok. So, what's a ... what's a somatic response in terms of light?
S5: It's like you have control over...like you want to do, so like me picking up=
T: = yes, so in terms of the eye and responding to light, what would be our somatic response, or our higher order response? (1.9) Alright, so you get a bright light and you get an autonomic response, your pupil dilates what's the other main function of the light response? (2.1) Maybe that's not a good question, what's the main function of the eyes?
S5: To... for vision

T: Right, for vision. Ok, so your somatic higher order, which part of the brain is that?
S5: The occipital lobe
T: The occipital lobe, that's right. So this is autonomic, is it going to the higher order?
S5: No, it's going to be a reflex
T: Lovely, it's a reflex. So, first of all, separate those out, so light comes in and what happens when it gets to the back of the eye?
S5: It causes the rhodopsin to split (in the rod cells) and (unclear) enzyme and.....yeah...the hyperpolarisation of the inner segment which stops the sodium ion channels, that releases the ..neurotransmitter
T: Which is?
S5: Inhibitory
T: what's its name?
S5: Glutamate
T: Glutamate
S5: So an action potential is set up and that transmits along the optic nerve.
T: Lovely. Now that response ...in terms of rods, that's the same if it's a somatic or autonomic, can't differentiate, the cells can only cause an action potential or not.
S5: So they're both the same for that?
T: The difference is, depending on which receptors each synapse is with, you'll get a different response so some of them, some receptors will just be detecting relative intensity. So if it gets a lot of impulses like so you're getting a huge amount of rods cells that means you're getting loads of light into the eye. That bit will go down the optic nerve but instead of going to the em...higher order... it will go to ? (2.3)
S5: The mid brain
T: So it goes to the mid brain. And here, what kind of...er... neurons will it synapse with?
S5: Relay
T: Relay, very good. And then it goes back out to the?
S5: Motor neuron
T: Which will go to
S5: Radial and circular muscles, and they will adjust according to whether there's low light or high light
T: Ok, which one's er... sympathetic?
S5: Sympathetic is ... dilation
T: So it is the... so what effectors?
S5: So if the radial muscles relax ...no, I'm getting confused...so it contracts
T: Yeah, so then if it's really dim you're gonna get the parasympathetic or sympathetic?
S5: It's going to be sympathetic
T: And therefore…?
S5: The pupils will constrict
T: Circular muscles contract
S5: Radial muscles relax, don't they?
T: ((nods))
S5: Yeah, that's the bit I wasn't sure
T: That's the bit, ok. It sounds like you've pretty much got the action of the rod cell. Now, not all questions are going to necessarily want that level of detail at the front so you're going to have to work out, usually it will be in the question it's where, what I call where the story ends. So, if they've already said rod cells depolarize under light conditions, how does this link to... they've already told you that bit. So you don't need to go through it...but I would maybe do a flow diagram for that, it's quite a nice one. ((Teacher moves to another student)).
S6: When you're trying to work out (0.8) repolarisation is when it's slightly more negative inside.

T: Is this ...is this in a neuron or=
S6: =No (0.7) you know when you have to do the action potential graphs when you've got sodium ions going in and then potassium (unclear) and then you've got hyperpolarisation that's when you've got resting potential, isn't it?
T: Ok, what's the top value? (Unclear) (5.3)
T: Ok, what's happening if I'm going to put the value here? ((Teacher draws on graph)) What's happening here?
T: and so what's happening in terms of the polarity? Sorry, what's happening in terms of the voltage inside?
S6: It's increasing ...it's getting more positive
T: More positive or... you were saying it becoming less...?
S6: Less negative.
T: Very good, ok. When we get ...what do we call this level here ((pointing to graph on board)) (2.3) The special dotted line
S6: Threshold
T: So what happens at threshold, sorry, what's the significance of threshold?
S7: Is it to generate an action potential? That you have to go above the threshold to generate an action threshold.
T: Very good. Ok, what do we call that response? (1.6) Something or something. (1.8). Ok, if I went...if I only got to here ((points to below the dotted line)) and then went back down again, would I get an action potential?
S6&S7: No
T: No. So because you have to...if I get beyond that can I stop it?
S6: No
T: No, so it's called an...(2.3) all or nothing response. You either go through and you get through the whole cycle or you don't.
S6: So you can't stop?
T: No, and you can't change really this bit ((points to the board)).You always get this pattern. So we go through threshold, so, what happens next? This is in a single point, so this is in a single neuron ((T draws on the board))
S6: So would this be happening in here?
T: This is when we're talking about an action potential this is in one segment, so this is all happening here so for the moment, forget about the other segment.
S6: So this would just be one and then you would have another one down here
T: Yeah. Let's just do this one and then we'll come on…alright. So what's happening at this... so we've got ... what's happening here? ((Teacher draws on board))
S7: Potassium ions leave the membrane
T: Do you I think that's down here ((pointing to a different part of the diagram)).
S7: Is it something to do with the membrane?
T: It's all to do with the membrane
S6: I think ...if you got sodium ions flowing ...in it's getting less negative which means it's depolarised?
T: Correct ...so where's that happening? Here or here? ((points to diagram))
S6: Here
T: Very good. So ((draws on diagram)) so sodium rushing in, as you said becoming less negative, it is=
S6: =depolarised
T: What happens at this point here?
S6: The sodium channels close and the potassium channels open so then the potassium ions leave the cell
T: Very good (1.3) So what happens to the charge of the cell?
S7: It becomes more negative
T: So the inside of the membrane becomes more negative, ok
S6: So that means it's hyperpolarised?

T: What this bit? No, this bit, what's this bit called if it's becoming more negative?
S6: This is depolarisation here, so repolarisation?
T: Very good. Ok, we get to minus 70, what's happening here?
S7: Is it the refractory period?
T: No.
S7: No
T: It's going below 70
S6: Which means it's now hyperpolarised
T: Good, it's hyperpolarising. Why is it hyperpolarising?
S6: Is it because it's more negative than what you started with?
T: That is what has happened, so why?
S6: Is it because an action potential can't be generated?
T: That is ...em...that is (0.7) that is the biological significance. In terms of ions why does this occur?
S7: Is it because there's more negative outside the membrane so the potassium ions leave (unclear)
T: Very good. If more potassium's going to leave what does that tell you about the membrane, receptors and channels?
S6: The outside is negative
T: Is it? If we want more potassium to leave are there going to be more receptor... channels open or less?
S6&S7: More
T: More potassium channels are open so you get hyperpolarisation
S6: So do more open when you get to here?
T: Exactly, just from there, there are more open than at rest…So let's get to this bit here. What's this bit called?
S6: Is that the refractory period?
T: It is, what kind?
S6: Absolute
T: Very good, why is it the absolute refractory period?
S6: Because it wants to get back to minus 70 to start again.
T: What cannot happen at the absolute refractory period?
S7: An action potential
T: Very good. So, what's this one called? (2.3) If this one is absolute, this one must be...?
S6: Relative
T: Ok, what does that mean?
S6: It can... it can generate ...
T: But it is…
S6: Unlikely
T: Because it is…
S7: Slightly more negative than=
T: =So what would that tell you about the stimulus that would be required to make it go through an action potential?
S7: it would need to be frequent
T: Very good, you would need a more frequent stimulus, very good. So, what you need to think about is ((teacher writes on boar)) charge, channels, movement, name. So for each of these this is what you want to talk about: so what's happening in terms of the charge; what's happening in terms of channels; what's happening in terms of ion movement; and what's the name of this period. It's a lovely one to do. Get yourself a little graph down the bottom and you can do a series of events for...but when we talk about action potential you're only talking about it at one point. Ok, I would do that first and then come onto salvatory conductivity which is how it jumps, ok.

((Talking with other teacher about a calculation a student has completed for an exam question)).

S6: ((Calls on teacher)) (Unclear) what sort of stimulus would you use?

T: You can have things like...em...(3.1) so let's say it's a... let's say you've got a receptor that responds to ...em so when ...er (1.6) let's say go for a chemical receptor so when it tastes...when it comes across H+ ions it causes sodium channels to open in receptor, the receptor then becomes depolarised, it's connected to the neurons so when the receptor depolarises it depolarises the neuron.
S6: So something like that would be a stimulus
S7: So it could be anything
T: Because I think you've got ...it's the same as the light↑ Think about your rod cells so the rod cell when it...when light hits it, it no longer releases glutamate, that prevents the...em that stops ...it's no longer inhibiting the cells, so the cell depolarises and that causes an action potential. So it's any cell that results in [teacher drawing on board] depolarisation so the NA+ ions going into the neuron at the...dendrite. (0.9) Ok?
S6: yeah

((Teacher circulates to check all students have past paper questions ready for the application stage. Teacher circulating - but no interaction with students, allowed to work independently to try new exam questions; students are not calling on the teacher in this phase of the lesson)).

End of recording.

Appendix Q: Q: J.13.3.13

J's Commentary on Observation 1

(Due to time pressures, the full recording was not transcribed. I transcribed all substantive comments made but did not include incidental exchanges made when watching the recording.)

J: So we'd just done about the eye and about what...controls the eye so this is a (.4) a recap question that's linking together ... all of the (0.8) topic, so we studied a couple of different bits and they have to link together two...two different sort of bits of content how... and to put that into one (conducive) answer. (1 min 45. The grade range is U to A...we've got a couple up at the top end ... em... we've got some quite high achieve...high targeted pupils who are underachieving a bit this year em… so students who did quite well at AS but are... struggling a bit with the transition this year em... so some of the January results were a bit disappointing.(1 min.34)

R: Would they be used to seeing that ((reference to standards on the board)).

J: Yes...some more than others: logic, definitely, and depth. Clarity? Er...(1.2)... clarity and relevance I do use but I'm not sure as possibly explicitly, I think if you...if we asked the students what these words meant or to put them in context, I think they can do these two -logic and depth quite well but I think clarity and relevance they might have a bit more difficulty. We use logic a lot because so many biological systems are a sequence of events em… and so they have to...they don't actually get marked on the logic but if they have the logical order it means they much more likely to get all of the marks, like the longer answer questions. (1 min 17) What's interesting is when I did this [topic of dark adaptation] originally I did it with a diagram, it's quite hard to hold onto it without the diagram there (.9) but I guess they need to be able to do that 'cos in the exam they won't necessarily get given it ...but still.

R: But I suppose it depends what your purpose is here - if your purpose is to ...(.9) to clarify understanding, that's one thing. If the purpose is to rehearse an exam performance, that's something else.

J: Yeah, that's true. This is what I find generally is that classes do struggle with… that holding an idea as they go from person to person, you know, linking those ideas em... which is what I think I wanted to do with this as well, just to get the full... linking steps.(6 mins.37)

J: [Commentary on the instructions about depth} Yeah...so I use that quite often because they'll give an explanation but it's a real surface ... surface explanation, especially at A2 they need to get into the real actual nitty gritty of why that is happening ... em...and when they do that, they have to make the right... link a lot of steps together like we're doing in the first bit, so ...yeah (17).

R: Would they have got information in their textbooks about this or is this just drawing on what they'd done=
J:= They will have information in the textbook, this is drawing on what we did last lesson, so it's just....we did it but when we said...at the end of the lesson how did people feel about you know, when we looked at the success criteria, people were a bit ...shaky

so I wanted to do a consolidation task just to ...em...just to ensure that they'd...they'd got it.(2 mins. 06). This section [on dark adaptation] took a lot longer than I was hoping but I think...just for them it was quite important to have got...to make sure they have actually gone through that...those steps, it just made the next section a bit shorter than I intended. (11 mins 12).

J: The answers to this section [perception] are based in the textbook but they've already been set notes so every ... they're already ...they're given ...em... sometimes just a broad heading, so you need notes on this chapter, sometimes I structure it and say I want you to answer this, this and this because sometimes they won't ... I dunno...they just miss...miss the point. Sometimes they need more direction in their notes so they...they're asked to make notes on this, they've already read through it so now it's...can they ...can they answer questions on it? (35) I think these questions on clarity, logic and relevance are so good, these are the questions they should be asking themselves when they've answered any question... because in the exams, this is where they lose marks because if it's ...quite often they'll write irrelevant information, it's not what the question is asking but what they want to write down but…em...if it's not logical and they've missed out those steps or, like I said, they've discussed around it but they don't have the depth of explanation to hit the mark scheme, so we do use them explicitly but there's also a lot of implicit use of these types of thinking em… clarity, I think, when I was starting to use it, I found it quite hard really to quantify for them what .... I know what ... a clear answer is but it's a bit hard to say how do you check your own work to see if it's clear or to check it has clarity? (7 mins 47)

J: When we went through these answers, I wasn't particularly happy with how it went. When we went through the answers their understanding seemed quite ... a little bit...just a bit woolly...and this bit was a bit rushed for what we had to get through...so. I thought it was quite a straightforward section of text but when they came to explain it their explanations were...they vari...they lacked the clarity em... I don't like to say but I think A [particular student] actually in the middle bit was actually...had a fair comment I think it was… I had a perceived answer that I wanted them to get to ... (6 mins 24) I thought they would get through this quite quickly, but they struggled a lot more than I thought. I thought that because this was just comprehension from the text, I thought they'd get through this quite quickly, and then we could spend more time on the studies.

End of recording.

Appendix R: J.29.4.13

J's Commentary on Observation 2

J: Overall, I've been using this type of session quite a bit and it worked particularly well this ...with this group that day.
R: Why...why is that?
J: I just think it keeps them very focussed, I think ... em... I had some feedback from some students afterwards and from this session when they were working on it they said like they really felt like it had embedded that particular unit they were working on...Em… and I think a lot of them do use quite inefficient methods of revision and I think, make them work through one bit in depth, the whole sequence I think...em...you can really like ch...otherwise I think they can skim through stuff without really improving it and I think it really does help to really improve one bit.
R: So, in terms of understanding, the first thing is checking their understanding, so that's in a way straight forward in that ... in that if they read something they know whether they've understood it or not.
J: Yeah, so some bits of this unit is particularly conceptually ... there are some bits that are conceptually quite difficult so there are some bits they don't understand, even if they've read it they just don't understand what it means or if you ask them to elaborate or to pick it apart, they can't, and that's what...there's a group of girls down the front who are doing respiration and...'I just don't understand this' so this first bit was just to work on ...if there are any particular areas that they ...they just don't understand.
R: So what did they actually have to do...to make sure that they'd understood?
J: Yeah, I suppose...I guess it was just working on their own judgement about whether they understood it or not. There wasn't anything specific, yeah I suppose they should have been able to explain it in their own words but that wasn't...that was implicit not (1.2) Yeah, I hadn't really thought of that. I think the usual…I don't know...from my experience of the class they're usually quite (.) reflective in terms of when they do...and when they don't understand it. And they've got to the point when they say 'I can tell you what it is but I don't really understand why' or 'I understand it all but I just can't...' and they can usually themselves gauge where they're at. (3 mins.56)

J: This candidate here is particularly difficult because he's got a lot of...em... mental health problems ...em...so I can't really be too harsh on him, he's got a lot of stuff happening outside that's very disruptive. ...He's actually doing better than some of the other students around him and he's really disruptive to them but he's doing ok himself. (2 mins.48)

J: It's quite interesting. I did a mock with this class today and the questions...the style of questions changes in this last unit from identify and describe and explain to loads of very open 'suggest' and out of context questions that give them something that they ...they haven't come across before but they need to make a couple of lateral moves to apply their knowledge and a lot of them really struggled with that. We have done some stuff on it but ...it's become...it's a much, much higher order thinking skill of ...well... how could this work, and then try to find ...like fill in the gaps, and they found quite challenging.
R: And that's a feature of the paper?
J: yeah (1.2) so it's much more synoptic and has a lot more of those open...em...the command word 'suggest' which means that there's not

a definitive ...they don't definitively know it but they've got to try and make that link.
R: You've got to reason your way through it
J: Exactly, exactly, and I think (1.3) I have been doing it but I think I should be doing it even more explicitly...quite often the final success criteria...the higher order one will be ...em...'a scientist has done ...' and give them some really random context and they have to try to explain it ...but probably doing even more of that. (6 mins 12)

J: ((Commenting on working with S3 & S4 on a board) I think a lot for me, it's probably the way that I think, but a lot of the ...em...biology is ...em for me...flow diagrams, particularly images of what's happening because loads of them are like...an interlinked pathway, and having the images and linking the yeah...I find for me it really clarifies...em...the process, otherwise if you're just doing the words it can become really quite hard to...to pick it all apart.
R: Is it this one ((R finds photo of student's work from observation))
J: yeah, this is the chemiosmotic hypothesis which is how ... ATP is produced in ...in the final bit of respiration and so there's... there's a couple of steps before that but the girls said, 'no, we're happy with that' and it is mainly recall as opposed to understanding as here you have to understand (.9) why it happens so it's... it's a lot of ...where you have to understand stuff from previous units about concentration gradients and how the cell membrane's set up and how hydrogen and...the electrons can split to actually get all of the detail in it. Em... so then what I usually try to do and this is quite common when someone doesn't understand...particularly stuff like this so you sit down and you talk it through with them, you get them to make the steps and tell you what's happening next, and then you draw it in and ask some leading questions, and once they've done that, they have to translate that into a series of written (0.7) logical bullet points that they will then have to use in the exam because they won't ever really get asked to draw it.
J: Yeah, when they come to the recall, they do their own. And I think that's quite a nice way of modelling for them good ...like good practice. (7 mins. 51)

((Talking about different types of students in the class))
J: Those boys we were looking at...where they love to talk about it but actually getting them to put a constructive thought down on the paper, they're really resistant and that's why they ...they think they know it but actually they can't formulate their thoughts into cohesive ... cohesive sentences that have logic and all the key words in, and that's what I really have to force them to do is to get it down on paper.(2 mins. 19)

J: So it's really only been this year that I've been trying to use those critical thinking words when you're trying to describe to a pupil what's missing in their answers. As quite often they will lack the ...specially at the AS they can get away with less depth, with A2 they need that much...em…the detail and it's quite nice so I've been trying to use that consistently so that they can get that (.8) they realise what...so you're consistently saying ...so when you say 'depth' they know what you mean. Em... equally the breadth, because the long answer is making sure you've got the start and the end one and you've got the whole sequence, so I think ...em...it does fit in very nicely there ... em... so pupils become aware of how their answer...how you can change your answers depending what the requirements are. (4 mins. 42)

((Camera on J working with 2 students))
J: Again…trying to use these leading questions and they just...either how I'm pitching it but they have no idea what I'm talking about and it just doesn't ... even when I try to break it down into what I think are quite simple gaps for them to make... em... they just don't get it at all ...em... but they're actually doing very well in their exams so...
R: How does that work, then?
J: I don't know ...Maybe it's just orally they find it difficult, and when they write they have the time to process...I don't know. (3 mins. 12)

J: ((Commenting on exchange between 2 students caught on camera, one testing another)). He's quite...if you listen to his questioning is actually quite good, it's like not just taking the answer but saying wha...what's that? I mean some people are different but I think for a lot of learners their recall is based on their comprehension, they have to understand it to...to... for the process to form in their mind. (2 mins.41)

J: The next stage (after this lesson) is the application stage so they will have written past paper questions so you've done comprehension, you think you can recall it, now write your answer. It's got to be succinct, using correct terminology and so it's sort of applying that to that particular bit …and usually in lessons, that follows the same format except I'll give ... I'll give them an application so there'll be something to engage with like a clip or a discus…they've made notes from homework, some oral questioning just to give them to do something to check, and then once I think everyone is happy actually, the best lessons are where I split it up, so I say, 'we've done that, put your hand up if you think you understand it and you're happy' and then they go on to do an application, and if they don't you separate them out and they come forward and I help smaller groups.(1 min. 56) Students identified their biggest red area from the past paper they did. They had to bring in 20 marks worth of questions on that area from past paper questions so they all had personalised exam questions to work on. (6 mins.18)

J: I think especially for revision, I think some of them do ask but I just think you may target....you know your ...if you did it every lesson you may target really well some kids but for some kids it's just not ... er...relevant .I think what's nice is that this class we've done a lot of stuff where they have split up, like done a lot of differentiated tasks and have said well, You pick your point, so they're quite good at going 'ok, well, I'm going to go here' and they will do it. I've done it with the AS but they're not quite as mature.

End of recording.

Appendix S: L. 25.2.13

Teacher L's Interview Script

R: Thank you L for agreeing to be part of this research so...as I...as I said the interview really today is just to explore your ideas and your thinking around about your subject and teaching your subject at A level and...er Critical Thinking and how the two (.) interlink (.) in...in anyway
L: Mm
R: So (↑) I wonder if you could start off by sort of telling me what are the distinctive features of your subject at A level, that's Philosophy and [Ethics
L: Mm]
R: Em...in comparison to what you do at GCSE what's distinctive about the A level programme?
L: Er..(.) okay it's really, really different er…because what we teach at GCSE is (.) effectively comparative religion and what we're teaching at A level is really philosophy of religion and ethics...and (.) just from a Christian point of view=
R: =right=
L: =So it's completely…completely different
R: Mm
L: (.) Em although there are...there are some cross over points like they do do a unit at GCSE which is called 'Believing in God' when they look at questions like 'does God exist?' And they look at a very, very simple version of the Cosmological Argument and the Design Argument so they do a bit em...but the focus(.) is very different em (.) so in a way it assumes quite a lot of knowledge of Christianity
R: Right, okay=
L:= Which is partly why we swapped exam boards actually because before (.) they didn't have any of that in their (.) course whereas the course we're doing now has lots of kind of ground work stuff so they do Plato and Aristotle and then Christian views of God because...with our kids you can't necessarily assume that they've got that=
R: =No=
L: =So that's why we chose it because we think it's better at…for grounding.
R: So in terms of the sort of content...so you've talked about some of the philosophical content
L: Mm
R: Could you sort of expand on the content that they need to know for the A level?
L: Yeah I mean ...I'm only going to give you the philosophy bit because I don't teach the ethics
R: Okay…fine
L: Yeah but I can tell you about the philosophy. Em… so they need to know for AS, do you want AS first?
R: Yeah...that'll be fine
L: At AS they start off with (.) em…ancient Greek philosophers so they look at Plato and Aristotle, and then...they do Judeo-Christian views of God which is all the sort of ground work stuff. And then (.) em they start to look at arguments for <the existence of God> so they do lots of arguments of <the existence of God>, they do …em (.) the Ontological Argument, Design, emm (.) Moral Argument, Cosmological Argument, and...and then they go and then look at religion and science ↑and (.) em...particularly ...em the creation and em...that kind of links up with again the Design Argument and then they sort of look at that as a critique of religious belief and the problem of evil, those are the two sort of critique ones.
R: Right…and in terms of if you had to sort of identify the core sort of concepts that they have to...be able to =

L: [=yeah em
R: work with]
L: Core concepts would be…(.4) em…they have to know the…One of the things that's the hardest thing is, is the concept of a type of argument. That's a real tricky one so…so an a posteriori argument as opposed to an a priori argument…And so with the Ontological Argument, I've just been teaching it… and they didn't get it ((laughing)) so...they...em wha...they have to get ...em…what ...what analytic means and that it comes from the definition so that links to the type of argument and then...but then also em...it's not exactly a theme but...but it kind of is a concept, the concept of a predicate and, well, the concept of necessary existence is a really difficult concept for them to get and especially because when you explain it you sort of say 'cannot not exist' and they say why don't… you just say "has to exist" but it's not quite the same thing and it's trying to keep that precise about the difference between the two things.
R: Right
L: And normally they get it (.) if we're lucky they'll get it just before the exam but the reason they don't get it is 'cos (.) and (.) maybe there is a better way of teaching it but I haven't come across it if there is but it's…I think when you start off I say to them "Do like you're learning a language, just learn the definition" because it doesn't make any sense but then when they've done the arguments then they've got something…kind of suddenly it...makes sense but it's often just at the end...and then they look back and then they say "oh that's what you meant" but (.) you have to, you kind of have to know the arguments to understand …
R: Types?
L: The types of argument …so that's a big concept. Em...in terms of the actual topics I think probably when they start off they need to understand what…the idea of forms and the world of forms and (.) everything that goes with that so then the review of reality but I think probably forms is the concept that runs through it ...em (.)with Aristotle it's the types of causes (.) em and then when it comes to the arguments for the existence of God (.5) causation...what do we mean by causation...em…then they would need to do (.) with Design they need to get the idea of analogy which they really don't=
R: =Yeah
L: So …em…what I've started doing now is doing…just doing like the internet…but just em...you know...like analogy games so they use in English em…even at a basic level just to get the concept of what this...it's a comparison because often they get really confused because then they say why (.)because they start thinking that you're talking about God being a watch maker and that's obviously not what you're [saying
R: Yeah]
L: So the whole concept of analogy (.) em conscience, when they do the Moral Argument, what do we mean by conscience (.9)
R: So if you had to em... if you had to sort of say...em what does...Critical Thinking or what does it mean to think critically in your subject?
L: Yeah…I mean…yeah… to think critically you have to ...they do do it all…all the time. I mean…that's just the AS course, the A level course. Let me give you an example from today what I've just been teaching before lunch they were learning...we just started the topic of life after death so we started the lesson with: do you think we have a soul? Then we looked at some film…like in 'Ghost' when the soul comes out of the body and they started off and they were quite clear, 'Yeah we all know what a soul means…' well nobody said 'I don't know what a soul means'. But only a few of them said, 'well, what do you mean by a soul?' Most of them just said 'yes, because my religion says it' or …em...only one said no. And they were quite okay with that and quite ...but then we em...we started to explore it and we did …em…thought experiments so it was to say like, 'if we swapped brains..(.) who would...who would be the actual person?' So...em… we started...the one the exam board says is like your best friend but then I did it with me and Laurie [another teacher] and I said if I

came in as Mr Carr and I was speaking in a Scottish accent but I was in this body ...and then it was like… so then it was whether ....so where ...so where is the soul then? Which bit's the soul? Which bit's the brain? And then by the end of it they were like well now we...we don't know...you know what the soul is ((laughing)). Although they still felt that they knew but it was kind of ...much more complicated than...so I think espec...that's kind of how it works at AS. You start off with things you think you know and then you try and apply it to certain scenarios and then you think maybe it's a bit more complicated than I first thought and they do that for lots of things...and I mean the other one they've just done is attributes of God and the same thing with that. So you're saying ...they all say...they all know the…from GCSE...they can trot off 'omnipotent' 'omniscient', em… 'eternal'. And so you say, 'right so do you mean God is outside of time or God is in time and then...and then they realise oh actually it's more complicated than ...So I think that's ...the first part of it is that, a realising that maybe it's more complex than it might at first appear and that's why there's so much disagreement...about things, and then (.) secondly I think it's being prepared to…play with ideas because you have to kind of go along with the scenario and …I think only one person said 'but that's never going to happen so why does'…because it...is…but it's just the fact that you're just experimenting so that is kind of part of it I think. And then the other thing is probably what we would have in common with all the subjects at A level is then being able to critique an argument and recognise the flaws and say (.) …or the strengths…and be able to say why.
R: And in terms of what's required of them in terms of writing…what...what do they have to do?
L: They have to ...em...well at AS they have to be able to…the largest part is just to be able to explain it clearly so they have 25 marks to just explain the argument and then really that's just to show ... so that's using key vocabulary, explaining it clearly using key thinkers and quotes but that's really just exposition. And then 10 marks (.)is ...is to critique it so they can do that in a fairly formulaic way, you can teach them here's a few arguments for and here's a few arguments against what do you think? Em...but then at AS...er…A2 it gets much harder because it's just one 35 minute essay and they've got to do the whole lot in one thing and they've got to work out a line of argument so (1) and it will usually be something like here's a quote and then discuss and they then have to construct …so they have to be able to construct an argument; they have to be able to unpick what...what the trigger words mean ...em… and then to be able to org...organise all that information into a coherent argument and be able to show they understand the possible opposite view as well.
R: And how do they deal with that?
L: (hhhh) THAT'S THE…THAT'S what they find really hard, really hard. Em…I mean I think at AS it's…actually at AS it's hard too because it's such a shock to the system because what they're writing often what they hand in would get an A star if they'd done it for GCSE because they know it and they've explained it correctly but (.)an… the…it's the same here but now you've got to critique it (.) But even that it...you can...you can kind of teach that ...you can sort of give them that more in terms of this is a strength, this is a weakness and they could in theory memorise it, although (.) when they're getting it more they can actually start to identify it themselves which is better because then you're...then you can say then which thinker can you use to illustrate that? But then, what they find really hard at A2 is then they've just got to do a whole essay and how to structure it and they find it (.5) they find it hard↑ to actually answer the question but I think this is true in lots of subjects but they never…they can do a whole essay without ever actually saying what they think about the question. They've just written what they know about the subject…so=
R: =Yeah, yeah
L: So...yeah…how to write an essay is I think part of what we're teaching them as well as the content.
R: And for the...A /A* at A level? What is special about what they have to

do for that really, really top grade?
L: Yeah...the thing that would be distinctive would be...em… that everything was relevant that they'd written and that it kind of built into it (.) The whole thing is sort of cohesive so you could see that there's a thread running through it and...em…it goes somewhere and then it ...em... and then it would …not just put… (.9) One of the differences you'd notice would be they'd have ...if there's a criticism of an argument they would then give a comment on that criticism and say why they agree with that thinker or they don't whereas a lower ...em…grade student would have the criticism but just think that's it. Because they've quoted a thing that's against they don't need to give their comment on that...em...So it's...it's being able to put their view and then back that view up with evidence.
R: Mm...mm
L: But that's not necessarily even ...because it would be even easier if you …they could say 'I think this' but it's not even that, it might be using a thinker to kind of put forward their argument.
R: Right...mm…okay
L: And also it will be to do with the quality of the language they're using, if they use technical vocabulary, if they use quotes
R: And what about the reading material they have to engage with?
L: They have...em...two...well, they have three lots they have...em...a book which is quite like a basic book which is what we use in lessons …em...which is very accessible and quite good for discussion because it just gives ...I think it's designed to be used in the classroom. But then for the content they have two other books, they have one that's…em…quite a dense ...textbook but it's kind of ...but it is kind of divided into sections and it sort of says keywords and it's written in a fairly accessible way and it's quite…sort of…em separated in a way they like. But it's quite technical language and it's quite sophisticated language but most of them are okay because if you do the thing in the class first so you set them up for that. And then there's another one we give them which is more evaluative ...em...and it's like a...it's...it's not ...I mean it is an A level textbook but it's not set up in the same way, it's more sort of discursive and no bullet point bits or anything, they hate that one ((laughing)). So you have to ...em...you have to make them read it and occasionally they might say that one was really...and I think, I'm hoping that when they go back over it and they read that one again ...it'll all start to fall into place so those are the main ones and we have other ones which we photocopy and use and they're some in the library.
R: Okay...so...em...thanks for that...that's given good context. So in terms of the Critical Thinking that you have been involved or...you know...been doing some of the Critical Thinking work from the very first off, really
L: Yeah
R: Em...what's your sort of view of it? How do you use it or how have you used it in terms of your A level teaching?
L: I think I use em...the teaching techniques from it so...em…so in A level teaching the things like the reciprocal teaching. I use to a point em...and then I…em…it's a tricky thing to do to get a balance with I think because em...because the texts are so ...so complex sometimes they...the danger with the team teaching thing is they'll ...em... teach each other wrong...wrongly. So…em… so I do use it because I think (.) sometimes like I've just used it in the last lesson but if ...if I want them to engage with the texts sometimes I'll get them to do that first and then I'll do my teaching because sometimes I think if I just teach them and they haven't even tried to access it then they can just start to switch off. But whereas, if you've tried it and you know that you don't understand what a predicate is and then I explain it, then they kind of ...then they can go back over it. So I use that one quite a lot. And I use...sort of...the term...the terminology on what...on what they're trying to do so things about...talking about precision and accuracy em which isn't exclusively Critical Thinking but it is Critical Thinking terms that lots

of us use so they kind of recognise those. So I think, yeah, at A level those are the main...the main ones that I would use. The Standards and things like that I wouldn't use explicitly I would (1.2) I would probably ...but I would ...I would make it part of the em... for example, when they're writing up a ...an essay plan, it would be, you know, make sure you're being accurate, make sure you're precise, say what you've...em… you know, before you start, so I would make them plan it out, and then I would use certain tools in there but maybe not explicitly referenced as Critical Thinking.
R: What sort of tools?
L: Yeah...so just that...just like saying ...em... well, the one I would use actually one I use loads with A level is...em… I suppose it is a Critical Thinking thing … if you take…take a quote and then put it in your own words and...and…yeah...I use...so that...that's a kind of tool that I would use a lot because they often won't really look at a quote and very often they'll just give you something that doesn't bear any resemblance to what they'd just read. But they ((laughing))they just...it has something vaguely to do with it and so, and they did it today when they...and they'd just finished teaching each other about the Ontological Argument and they didn't...it was a really difficult quote… a really dense quote from Anselm, so it's really old as well, and...and so what does that mean? And they'll just tell you something well...and they told me an argument that had nothing to do with it but they just hoped it might becau...and rather than actually ...really look at it, and they'd just done that as a team…reciprocal teaching thing and lots of them said it was too much and left it, a few of them did, and they did look up...look up the words in …em... but that's where I think probably the Critical Thinking helps a lot because whereas before that I might have just said ...I would have just explained it but I think to say to them, right look it up, find out what it means and they're much more in the habit of doing that and so they look at it, and then maybe still they don't understand it but at least they understand the vocabulary and at least they've had an attempt at it and then you can explain it. So that's about precision really em...and yeah...and accuracy because just looking at what's actually there instead of what (.8)because it's kind of about the...an effort thing really as well, to really persevere with that.
R: An intellectual effort
L: Yeah↑ yeah, that's what it is because...and some students will do that, so like I was saying, break it down and that kind of thing. But some of then will just go 'ooph, it's too much'.
R: Okay…well...you sort of...sort of ...the next ...one of the areas was really about the impact on…on the students so in terms of their thinking or their contributions or their reading or writing when you try or when you use some of these approaches, what do you notice about the impact on students...either positive or negative.
L: I think em(.9) a lot depends on the student ... em...but I think as a…as a habit they are much more used to...they will look things up now automatically ...em...so that's a good thing em…I don't think they would automatically really persevere we...↑some of them...some of them would actually, some of them would ...if they take a difficult quote, they might actually try and ...em...really struggle with it...em whether they would do that on their own, I don't know, but they will do it in class with a bit of persuasion usually. Em...and then (.) so the impact would be I think that they understand it better because rather than just put the quote up and say 'put that in your essay' if they don't understand what the quote meant that will be partly why their analysis is wrong because they didn't...or why they didn't put it in, because they didn't understand it, so although it is very time consuming you...you say out it into your own words and then 9.) you know wh…how far…how close they are to the understanding by what they write and then also when they come to compare it then they change it and things so that's …there's quite a lot of shared learning ...often with that, so I think that's really useful. And em (1.6)…and I think...I think …it some ways it's hard to isolate it as one thing because I think a lot of these things link up together ...em... but

I think the combined effect is that they are becoming more independent and (.7) they're having to ...yeah↑ And they ...they are...they can be quite good at really struggling with...persevering with difficult concepts and that's probably just ...that's partly practice I think as well.
R: So, in terms of your deve…your development of Critical Thinking in what you do, what have you found that has sort of enabled that or helped that or facilitated that? And what have you found that may have thwarted it in anyway?
L: In terms of ...things like insets that we've done?
R: Anything at all.
L: I mean I think…I think it's helpful the sessions that we did at school em…initially I think that...as an introduction to it and a kind of an overview, and then em...I think there's a lot of value in learning it with other people as well because you can sort of share ideas and take other people's ideas. And I'm quite fortunate as well being in a department where everybody has done it so we all ...em...we do share resources a lot and we do …em... and also you kind of reap the benefits from that in the terms of…if you want to use something you know that most of the students already know how to use it because they've done it with another teacher, so that's very helpful. Em…you're not doing as much ground work. Em...I think (.6) I think when we went to San Francisco that was really good in terms of getting…em... a broader view ...and...em (.) You know certain workshops that were really kind of contextualised it for teaching and I think that was really good. Em..I suppose the other thing was when they ...I think they made it go too far which made me think, you know, when they started saying you could apply it to your love life ((laughing)) or ...you just think at some point you can't ...I…there's a part of you that's critical and there's a whole other part of you and they...they didn't seem to acknowledge that and I don't think that it's the sort of a blue print for life, I think it's a useful tool ... And I don't know, ↑maybe the American system is different because the way…I mean...and I don't have anything really to compare it with but they talked about it as if it were revolutionary to...to get students to do these things but for us it wasn't such a stretch I don't think to get them to do those things but that may have just been the way they were presenting it, I don't know. So I think I got a much deeper understanding of it but I think I also thought well 'this much and that's enough'.
R: And what about ...does the...what you actually teach, your syllabus, your exam requirements, how does that fit in, in terms of...does that ...is that…is Critical Thinking something that helps achieve that or is it something that's sort of separate to it?
L: No, it is and I ...(.hhh) I mean I think...the way I think about it and maybe it's made me more confident in my teaching to kind of come off track a bit and do it my own way and teach in quite a different way. I think it's...probably more noticeable at GCSE because at GCSE whereas I used to sort of just go through the book and you know make sure you've covered each lesson and they know what they're supposed to know for each lesson, and that works as well but em (.) but then (.) with GCSE I think ...you can...there's certain ...certain themes here that are going to apply to all these topics so if you teach the themes they'll then...they should be able to work it out before I teach them and so, for example, we've just done...we're just doing capital punishment and so, because you've gone, right forgiveness is really important what are the teachings, justice is really important, so here's people who think they agree with it, here's people who think that they disagree. Why are they going to say it? And quite often they can tell you now before I...before I would look in the book and then we'd look at the book and check, as opposed to doing it the other way round.
R: Right
L: So …but it takes quite a lot of confidence to do that because it means you have to do lessons that are not related to the book at all and em…probably if I...because I'm …you know...established in the school I'm all…I can do as mu…I can do that and as long as I'm there when I need to be there, it's fine. At A level, it's ...it's sort of harder to do it

justice, themes, because (.) they're not quite as overarching or simple, actually, as they are at GCSE so at A level I think I would...to…you have... a need to break it down a lot more, explain it a lot more…so...em (.5) yeah.
R And any...any blockers, anything that sorts of stops you doing what you would have liked to have done or thwarts you in anyway?
L: Emm (1.8)… it's probably just time really but I think that's …inevitable... because I think …I think a lot of the stuff that we're trying to teach at A level ...we...we have never taught them and then suddenly we expect them to know how to do it so…so what ...what we ask them to do at GCSE was to memorise information and repeat it accurately in the exam with a little bit of analysis and evaluation, that's at RS, but in a very sort of straight forward way: here's an argument for, here's an argument against. But how to construct an essay and how to kind of organise information and… think in that way…<is a whole thing> and I think probably what can thwart it is that in one way I would try and…you know...I might teach…I'd like to teach an essay and this is how we think and this is how we org...which is quite Critical Thinking based.
R: Yeah
L: But that could be a whole lesson and I know that I've got to cover this content. So, it's just trying to...(hhh)...you know...because you have to cover the content but really...and I know…I know you can teach the the content in a Critical Thinking way, like...em ...you know like you teach...you do reciprocal teaching or you do an...so there's still thinking in an active way but it's still not quite the same as teaching them essay technique and things like that, so that's a separate skill em…which they need and they're not...I don't feel that we're really preparing them for that lower down, in RS, I don't mean other subjects …because they're not...it's not req...they don't need it. And also when you're thinking about GCSE then ...well a lot of the students aren't going to do A level so you're preparing them for a specific exam and then...and then now they're...it's a different thing so I think that (.8)(.hhh)…yeah… that's what thwarts it because I think that there are...there's two things you're trying to teach them: one is the content and the concepts; and one is the technique of writing fluently in...it's a kind of academic literacy thing…And they need to be able to organise their thinking into a coherent line of argument as well as just understanding the topic… I think...I try and do both but ...em… I think I'd like to have more time to do that in more depth...and more time to practise it ...really because I might teach it to them and then give it...but it's actually having time to ...look at it and review it and all that kind of thing in the lesson, which I don't think we have enough of.
R: Okay, my sort of final area is ...is...er…if you could develop your teaching in any way you'd like without any other restrictions imposed on you
L: Yeah
R: what...what would it look like and why?
L: In terms of Critical Thinking?
R: In any terms you like.
L: Yeah (0.7) I think it'd probably link in with that actually I think I'd probably quite like to have some lessons where we could just look at how to construct an argument and maybe look at samples of ...work and ...em...and really analyse what makes a good argument and why it's not ...em… I think that would make a big difference. (.9) and if we could...just if I could crack that that would be great, if I could crack how...em...and rather than just...and we keep....we've done it, it's our sort of focus in RS for academic literacy and we've done like a pro-forma for this is how you structure an essay and we've given them sentence starters and 'use this formula' but it doesn't work because no formula works so once they try it...it's better than what they were doing before but then we looked at it again and said no…it…it needs reviewing, so, if (.8) if...I think...to be able to find a way of teaching them to (1.2)...yeah...to be able to organise their thinking into a coherent line of argument as well as just understanding the topic.

R: Yeah...okay. I've sort of covered the areas that I had down. I don't know if there's anything else that you wanted to add in terms of what you do or Critical Thinking or your teaching A level that you've not mentioned already.
L:(2.4) °Just trying to think if there's anything I've left out (1.3) I suppose the other thing would be in terms of A level to...that would make a massive difference would be to get them to be more independent and more...because they are more independent but...not just independent but to actually want to go and read around the subject and to independently go to the library and there's a few people who do that but for that to become more habitual and …em...I don't know how, I don't know how you do that but that would make a massive difference I think.
R: That's something that's lacking you think at the moment?
L: Yeah, yeah because (.7) (hhh)(.5) but I don't think, I mean (.5) I don't think we're unusual in that way and I think it's probably human nature and I think I was probably the same at school, you do what your teachers give you to do, and you do the homework you're asked to do and...em..(.7) maybe only later you realise actually it will be really useful if I read this and read this but…em…but maybe if you could get a culture about s...about doing that, that would be really good, and you'd need to have more resources than we have as well because there are certain books that are really good and they'll all go and take them out and then there's not enough so that there is that ...yeah…but I think that ...and that's probably a whole school thing that might be a useful thing. And where they're reading more lower down the school, that might make a difference, they'd be more ...used to doing it when they get to A level.
R: Okay? Thank you very much L
R: You're welcome

End of recording.

Appendix T: L. 4.3.13

Lesson Observation 1 Transcript

((Teacher organises class as they settle. Whiteboard slides on display asking students to check with each other their homework grids))
T: Ok, what I want you to do is check with the person next to you to see if they've got something that you haven't((homework grid on thinkers supporting the Ontological Argument for the existence of God))
T: ((To S1))Did you do it differently?
S1: Yeah, I just wrote it
T: Oh, ok, well done (.8) that's just as good, actually, what you've done, that's fine.
S1: And then that's the....((shows teacher the sheet))
T: Well done, that's good. ((Teacher circulates to check homework)). Ok, you've got a gap here, what happened there?
S2: I didn't know what to write. On that double sheet it didn't have that much about ...it just had the names, it didn't have what they said
T: Which double sheet are you talking about?
S3: I didn't use the sheet, I used the book
T: That's what you were supposed to...
S2: (unclear)
T: Yeah, there are...there are. Ok you can add that later, they won't all be in this one, because remember this is the simpler sheet so you need to use your other book as well. Ok, so you're going to have to fill that in after. RIGHT, GUYS, IF SOMEBODY HAS THOUGHT OF A GOOD IDEA THAT YOU HADN'T THOUGHT OF, CAN YOU ADD THAT INTO YOUR SHEET NOW. ((To S4)) So you've got everything but that bit.
T: (To S5)) You haven't got any modern versions, ok, you've got some gaps there.
S5: Miss, I don't know what you meant by modern versions
T: Ok, that's fine, we'll go over that
S6:Oh, miss, for modern versions I wrote Hartshorne
T: You could, we 're going to do that today, so you don't need to worry about that. Ok, could you get ready to tell me something you've found by looking at somebody else's, maybe if they had an idea that you hadn't thought of. Get ready to feedback to me what...what you learnt from looking at each other's. (35.2) ((Teacher circulates)) OK, 1 MORE MINUTE THEN I WANT YOU TO FEED BACK.(57.7)
T: A, can you tell me what you found when you were talking to M? (10.08)
S6: (Unclear)
T: And where did you find that?
S7: In the big book
T: In the big book? Well done! Did anyone else look in the big book? And you had the smaller book as well to use to help you fill it in.
T: I, did you find out anything from R?
S8: R found that Gaun…Gaulino?
T: Gaunilo
S8: Gaunilo …Gaunilo's argument was very string because…em it kind of refuted what Anselm was saying
T: Why did…for what reason?
S8: Er (.8) she didn't really say anything about that but she said it points out the major flaws in the argument …she just said that it points out the major flaws in Anselm's argument
T: Who said this?
S9: I did
T: So what are the major flaws, then?

S9: Well, I meant to say Kant because like he says that like not everything… like not everyone can imagine as well, so that, like, goes against what Anselm was saying
T: Why?
S9: Because he goes,like, just because you can imagine God, everyone …like everyone has a….like God exists
T: Right, he doesn't say that though, does he? He doesn't say, if…if that was the argument, ok, it's not just you, R, lots of people are doing this, that's not what Anselm says, you've got to give Anselm a fair crack of the whip, ok? He's not saying, just because everyone can imagine God, God exists. What are the gaps missing? Remember we had the gaps missing before, didn't we? What are the gaps in that, R?
S9: Like everyone has the same concept of God like all the descriptions and [that
T: What, no, no) no, be careful, be careful, he doesn't say everybody has the same concept of God
S5: A concept of [God
T: Right] He says everyone has a concept of God in their heads, so you've got the theists with a concept of god in their head, and then you've got the atheist. Then what does he say, R?
S9: Em, that, like the theists have him existing which is greater than him existing [in (unclear)
T: Good, well done!] Now that's an important (.) step, do you remember that I said it's like Jenga, you can't miss that bit out, it's better to exist in reality than just in the mind. Ok, you can't conflate this, if you conflate this, it doesn't work as an argument. Do you know what I mean by conflate?
S3: Mix it up?
T: Yeah, just squash it all down and just try to simplify it, you can't do that. You need all the stages of the argument. Ok, good, go on.
S9: So basically, Kant says that…er…like, that everything like…you might, like, can think of, like, em (unclear) ((talks to partner)) like coins. He said like em… having an existence doesn't make an arg… like description (unclear)
T: Good, well done, what is, what was really good there was you used an example, so well done. Ok, going back to this, this is something I'd like you to discuss (.9) kind of following on from what we were talking about because...em...(.9). How many people did use the other book as well, apart from M? Well done, all of you, that's excellent. Ok, so, why, and I'm sure I'm not the only teacher who keeps going on about this, why do teachers keep going on about wider reading, wider reading? Yes? Ok. First of all, what do we mean by wider reading? Let's just clarify what we're talking about.
S9: Different sources
T: Different sources. So give me some examples of different sources.
S9: Internet? What do you think about the Internet as a source? Why would be...what would be the strengths and weakness of using the Internet as a source of wider reading?
S2: I think it's because the Internet is unreliable [because
T: it can] be, why...how...why can it be unreliable, D?
S2: Because sometimes Wikipedia can get stuff wrong and (.)
T: Ok, so it can be unreliable, that could be a weakness. What else? go on
S10: sometimes it's written in …using some words that might not be familiar
T: Ok, so it might be which isn't necessarily a bad...a bad thing but you just have to bear that in mind. Go on
S11: A lot of the time, it's very complicated as well.
T: What do you mean by complicated?
S11: There's like lots of words you don't really...really understand
T: Is that strength or a weakness?
S11: That's [a weakness

S9: strength]
T: Ooh, you say it's a strength, you say it's a weakness. Why do you think it's a weakness?
S11: Because if there's lots of words we don't understand we have to go and find them out which makes it harder for us
T: Why would you not find them out, G? Is that not a good thing?
S11: Well, no, it's more [like of a puzzle
S12: more time consuming]
T: Yeah↑ Well, I think that's quite good, G , isn't it, if it's a bit of a puzzle? Is that not a good thing?
S11: But there might be other good sources that can teach us in simpler terms which might be easier to understand.
T: I'm kind of going to go with that because I think...but simple is not necessarily what I'm looking for but I think they might be more effective, what were you going to say, B? Because you said it was a strength, didn't you?
S9: Yeah, because you can find out something you don't know, like it helps you to have like more knowledge of stuff
T; Ok, but still I'm not convinced about this whole Internet thing, is it going to be the best source for what you need?
Students: no
T: Ok
S7: Books
T: Ok, so why are books more likely to be, for what we're trying to do here, going to be better? Go on, D
S2: Because a book is specifically published and created for that purpose
T: Yeah, ok, there are lots of books, go on, C
S13: There was that...that time when we...er...had to do the contingent thing a we got the wrong em(.3) definition because that's what people …but it wasn't exactly the right definition
T: It was a different context, wasn't it?
S13: Yeah
T: That's right, ok, the thing is, there are lots of books that are perfect for what we're trying to do, and I've got an example of one today. And they've been written with 6th form in mind, ok, and we've got lots of them in the library, and I know Mr B has bought some for you especially as well. Now, these authors, they've put a lot of thought and time and care into these books, and then they give them to the publishers, and the publishers sell them. If they put that on the Internet as it is, what's going to happen to the sale of their books? (.7) No one is going to buy them if you can just download it so they don't put any of the really good stuff on the internet, so a lot of the stuff you get on the internet is just going to be ...quite random, whereas this ((points to copied extracts)) if you choose carefully, you going to find things that are much better for what you're doing, not necessarily easier, but maybe more relevant. So what else do we mean by wider reading then, D said different sources, what kind of things, go on, D
S2: You can just find out more information, as well
R: So, yeah, explain what you mean by that
S2: You need to use your initiative
T: There's a great word, what was that word you said?
S2: Initiative
T: So...so what would that involve, using your initiative?
S2: So being proactive and doing something that someone hasn't asked you to do
T; Give me an example
S2: Let's say I'm a bit confused on the Ontological Argument; I can read it up in the library
T: You could, you could go =
S2: = to help my understanding of it
T: Or you could do, what some people did, when they had this gap, they didn't have any modern thinkers on the sheets I'd given you, so

some people did exactly that, they used their initiative, they used the other book and they were able to fill it in. So that's really good. So that's...that's the kind of thing we're talking about and that's ...it's...yeah...using your initiative and doing a bit extra than what you've been asked to do. So why do you think teachers think this is such a good idea?
S14: It will improve our writing
T: Why would it improve your writing?
S14: Emm...creating vocabulary
T: Yes, very likely, because you're going to have a broader base to read from, Yeah, anything else? D,again?
S2: And it makes your job easier because the students already know what they're talking about
T: Yes it does because we have to...I know you feel this as well, but we're going at quite a pace to get everything, and the more you do in your own time, the better it makes it. Ok, so it does help, but it's also because you know, because, we're not just training you for this, we're training you for university and that's what you're going to be doing all the time. So, with that in mind, I want us to think how we are with ...We've kind of finished this topic, we've done this topic but I want to see (.) where you feel you are at the moment, ok? So, just...em...decide where you think you are ((points to traffic light statements on IWB)) you only have to write down the number and I'm going to come round to have a look. So, if you think, I'm really properly confused, I can't make head nor tail of it at the moment, I'm still really stuck, that's then red. Amber, you kind of know what...when we're talking about it in class, you can kind of keep up with it, keep up to speed with it but if I said to you now "you explain it" you'd be like, "Oh, I'm not sure". Ok, so it's kind of like you can follow it but you couldn't explain it. And then if you think, " yep, I'm really confident, I would be happy teaching this to someone else, that'd be green". So quickly write down where...where you feel you are at the moment. One sentence, where you feel you are, and then why.
T:((Circulating)) Ok, where do you feel you are?
S11: Yellow question,
T: So bits of it yellow, bits of it green
S12: Yellow...or amber
((Several students identify themselves as amber))
T: Where do you think you are?
S8: Yellowish green
T: Bits of it...which bits are yellow, which bits are green?
S8: Like all of it's generally green but it's just like I missed out bits of it
T: So some of the stages of the argument?
S8: Yeah
T: So that's good, that you identified that, go on
S13: I'm...er...yellow
T: Go on
S3: I'm amber at explaining it, but other bits I'm green, like all of this ((pointing to notes pages)) I know, but that bit…I'm not sure if I could (.5) like really explain it.
T: It's just that little bit, ok. OK, RIGHT (22.19) ((Teacher checks students have sheets for next task))…Can we check we all have a copy of this in front of us…So, this is(.) from a fantastic book. That's good, that's about where we should be, and this is where the wider reading is going to help us because this stuff that you do, like, D said, taking the initiative, should be able to push that up to 'green', ok, and it's what you do on your own that pushes it up to 'green' but it's also what you do with the text (.4) when you've got the text. So, we're going to practise that, so rather than just going (.6) em (.)'I don't get that word' you're going to actually look it up and make sure you understand it, Ok? So, we're going to do what we did last week when we do...em...the reading to each other

thing, ok. And we're going to do the same thing… I'm going to give you, like, half an hour, and then you're going to feedback (.3) em,...like we did last time, we did the dice, and we'll feed back what we've just done. Now, the other thing, M, is you've just done this, it's not new, ok, what we're trying to do is we're just trying to kind of move it into this ((points to green section on board)) so that it's a bit clearer. And one of the reasons why I think this wider reading is so good, I think this book, this person who wrote this book is brilliant at explaining things, ok, and that's one of the reasons of doing (.) wider reading, because you might read one book and think 'that really doesn't help me' but another book↑ it might just kind of fall into place. Ok, so, on the first page (.6) let's just have a look, in this section ...((teacher reads from sheet))'We look at ontological arguments and the criticisms made of them developed from the time of Anselm through to Descartes. We shall also briefly look at modern perspectives', so anyone who's got that gap in their modern perspectives, they can fill that gap from this bit here. ((Teacher organises students into pairs)).What we will do is the first two paragraphs, ok, and then I'm going to ask you to (.) explain them. When we explain it (.3) what's our criteria? What am I looking for? (.6)
S4: Em, key thinkers
T: Yep, it might be key thinkers, good.
S6: Structure
T: When you say structure, what do you mean by structure?
S7: When you go from one point to another?
T: Yeah, so it's...if I say coherent structure, what does that mean? Because that's what they say in the exam (.4) specification. What does coherent mean? (.5) Go on
S6: It's that like the things follow [so that
T: Yeah]
S6: they make sense.
T: It makes sense, yeah↑ It makes sense, the points follow on logically from each other so it shouldn't...shouldn't be jumping about from this point to this point, it has a (.) ok, good. What else?
S5: (.4) Em...quotes?
T: Yeah, good, quotes and they need to be accurate ((teacher writes on board)) and remember, what was that?
S5: Precise
T: Ah, fantastic word, ((teacher writes up on board)). What does that mean?
S5: Accurate
T: No, what's the difference? What's the difference?
S9: Precise is like when you say something like zero point zero, zero, zero point
T: Yeah, ((laughing)) yeah, it is, it's like ...
S9: Ah, and accuracy is just like, if something's correct
T: Yeah, that's right, ok. So, precision is...if I say …em the pen's on the table
S6: That's not precise
T: That's not precise, how could I make that more precise? (Several students shout out))
T: I could measure exactly where it is on the table, that's right. And precise, there's a difference (.2) and also (.) and accurate, so for example, we could just say Anselm says that (.3) em...like...like R did at the beginning and Anselm says that ...em...so God exists ...or we could make it more precise and go here's the stages of the argument as to why he thinks that but they have to be accurate, so you can't leave a stage out, ok? Right, so (.3) 10 minutes? So, do the first...I reckon you'll have time to do the first two paragraphs, ok? Ok, do the first paragraph, and then be ready to feed that back(.) ok, and then do the second. ((Students released to work on reading)) And dictionaries are at the back, and

you are allowed to use your phones if you need to look something up. Ok, off you go, 10 minutes.

((Students reading in pairs))
T: ((to a pair)) Guys, you might not necessarily want to write the whole paragraph, you might want to look at it first and then write, or do you find it easier doing it that way round?
S6: Yeah
T: All right then.

T: So what does it mean?
S6: Ontological? Only one logical answer
T: Yeah, logically necessary conclusion
(2 mins 03.6)

S6: It says 'deductive' here but it doesn't give (detail)
T: Right, so is, this is what we were talking about, is that necessarily the best source for explaining it?
S6: No
T: What would be a better source? ((S points to another book))So why don't you look it up in there? I think it' even got a glossary... Yeah look, ((teacher turns to back of text book)) so that's a good example of where (.) in a different context it's going to be...it might not be what we're talking about, whereas this ((points to book)) might be better. Try that. (2 mins 23)
S11: Miss?
T: Yeah
S11: you see this part here, it talks about God is (unclear) deductive so is it saying that reason… by reasoning we should just (follow) it?
T: No, no no no no, be:cause they're saying (em) the process is supposed to be deductively valid, ok? Just like (.3) what...what other things have we come across that might be deductively valid? What other arguments?
S11: (unclear)
T: no, no, give me one that's not maths
S11: Em...a square has four sides
T: Yeah, a triangle has three sides or a bachelor is an unmarried man, remember those ones? So you get it by un...unpacking the meaning of the word, ok? So, because it's from the meaning of the word, you can't come to any other conclusion and still be logical, can you? There's only one logical conclusion. So what they're saying is, if they accept the premises as true, the conclusion follows necessarily. (.6) What does that mean?
S11: If it's deductive then it's=
T:= yeah but what ...what's the premises mean?
S11: What you're trying to say
T: what do you mean by what you're trying to say?
S11: what it's trying to state, like, sentences
T: Yeah, sentences, so it's a stage in the argument so a premise ...premise is a sta... so if that premise is true then it leads to that premise then it leads to that premise you're going to get(.) the conclusion.
S11: So this sentence has to be true (.2)
T: No↑ but...the argument, yeah, in other words if we accept the premises, as in a bachelor means an unmarried man, then if you say that D is a bachelor, it means he must be =
S: you don't really need a conclusion
T: no, you don't, so that...that's the whole point, because it's contained within the word.
S1: so you don't need a conclusion↓
T: No you don't, so that's it exactly, yeah it's...it's...in a sense but the conclusion is obvious, so you don't always have to spell it out. So what Anselm is trying to say is (.) that if you look at what

the word 'God' means, the conclusion's obvious. That's why he says 'the fool in his heart says there is no God' because what he's actually just doing is analysing the words
S: Ah, I see!
T: Does that make sense?
S: Thanks, Miss
T: And that's why, if he can prove it, it's going to be an incredible achievement for human reasoning because everyone would have to agree that it's just as logical that god exists as that triangles have three sides. It's a done deal, yeah?
(3 mins.12)((Teacher circulates))
T: Have you written it up so you can explain it?
S1: Yes
T: Excellent, let's come and have a look then (2.3) Right, tell me (.) explain it to me
SI: Em...the ontological argument which says that, wait...em (1.7) the (unclear) states that can only be one answer if it's a deductive argument
T: Be more precise, what do you mean, there can only be one answer? Is that what it says?
S2: It's deductively valid
T: What does deductively valid mean?
S2: That means that you could only have...there's no multiple probable causes, there's only one positive cause
T: No, no, no, no. Right what does deductive mean?
S2: One possible=
T:= one possible conclusion, so it's a logically necessary conclusion, remember that?
S1: Yeah
T: Why is it that it can only go to one possible conclusion?
S1: Because ...em...causes for God, it wouldn't make sense
T: Huh?
S1: It wouldn't make sense if you had five different causes of God
T: That's not...that's not the argument, though, D, is it? That's just something that you've picked [out of the air
S1: Oh because] (unclear) is the same
T: Right, because it comes from the meaning of the word, it comes from the definition
S1: Oh, and you can't have more than one definition
T: Well, you could have multiple definitions but if you choose a different definition, the argument doesn't work, ok. But this isn't what they're saying here is it? It says ((reads from text)) 'if we accept their premises as true, the conclusion is said to follow necessarily' (.8) that's not the same as that...you see how that's not (.4) what they've said. So a coherent conclusion will follow, well we can say that about an inductive argument but they're not...not talking about inductive they're talking about deductive.
S1: Oh, so the answer is in the meaning of the ...er...word
T: Yeah, so you've got to be a lot more precise than this, guys, this is....this is close to what it says but it's not actually what it says, so have a little review of it and see if you can make it more (.) accurate.

((S12 using phone to check words))
T: What word are you looking up?
S12: 'unassailable'
T: Right, good.
T: How are we doing?
S12: I thought I got it before but now I'm struggling
T: Why?
S12:I think it's just a lot of information
T: Yes, it is, but that doesn't mean you can't do it
S12: I know, it's just different than we did it last time

T: Yeah, so maybe it's a bit more challenging. So how....can you explain this bit, then?
S12: Yeah, I've sort of written it out
T: What have you got?
S12: so, the ontological argument for existence has to be just one reason behind it=
T:= Ye:ah, see it's not that it's just one reason, that's not what it means. What does deductively valid mean?
S12: That is straight to the conclusion, is inductive when you have so many reasons =
T:=Yeah↑ yeah, you're right, it's one logically necessary conclusion, but why (.) does it lead to one logically necessary conclusion? (2.6)
S12: Because it's...is it ontological because there are more (definitions)
T: Beca:use it has to go from ...em... the meaning of the word, if you know what the word means=
S12:= Yeah, so like perfect, you know what god means=
T:= Yeah but just like if we say the word 'bachelor', you know what that word means, what does the conclusion have to be?
S12: That you're single
T: Yeah it has to be, if you know what the word means, ok, that's...that's why it leads to a logically necessary conclusion
S12: Yeah↑
T: If you say 'circle' has to be round because that's what the word means. So what Anselm's trying to do is say 'God' if you understand what the word 'God' means
S12: It has to exist
T: it has to mean 'exist', it has to...it's part of the meaning of the word 'God'. You see? Does that help?
S12: Yeah...so instead of saying there's only one reason, we have to say that...because we know what (.) God is, so perfect=
S3: =exists ...so that if we thought of God, it must exist
T: Yeah, but...but the point...what ...all they're trying to say here is that because it's a deductive argument, you get it by analyzing the meaning of the word (1.3) Ok?
S3: Ok
T: But it's not just randomly one logically necessary conclusion, it's because once you understand what the word means it can't go anywhere else because that's part of the logic of the word
S3: Ok.

T: GUYS, LET'S COME BACK TOGETHER FOR A MINUTE.(40.37)
T: GUYS, LET'S COME BACK TOGETHER FOR A MINUTE.(40.37) Em...you're doing really well because it is quite (.) dense, isn't it? There's quite a lot there but what I'm pleased is that you are actually trying hard, I can see you looking things up, talking about things, that's excellent…how are we doing for time, are you still on the first paragraph? Most people?
Students: Yeah
T: Ok a few more minutes and…and make sure it's what it actually says, not close to what it says.
S13: Miss, you know when it says like you have to draw the existence without looking at observation and stuff, can you say like it's a tautology?
T: Yeah, that's right, that's why, because you don't need to look at anything else because you can tell from the meaning of the word. Absolutely, tautology is spot on. So, what is Anselm saying as a tautology?
S13: Em ...the existence of God
T: Yeah, it is like...to say...to say there is...to say 'God' contains within it the idea of existence, yeah
S13: OK

T: Ok, 2 MORE MINUTES

((Feedback - students chosen at random by electronic dice ,each student has been given a number earlier in the lesson)).
T: Ok, M, have a go
S7: ((Reads from her notes taken from the reading task)). Ontological arguments for God only have one logically necessary conclusion .the argument that god...if we accept the argument that God exists then there can only be one conclusion, if the argument is successful then it allows us humans do know that God does (unclear) really exist but before the argument can be successful we have to make sure that the propositions of the argument are true. Ontological argument claims that their premises are unattackable as they only care about the definitions and the concept of God. Because they look at the concept of God before evidence of the world they think that it is a good starting point. And that's where I got to.
T: Well done↑ That's really good, M, well done. ((Class claps)) Why was that good? What good things had they done in that?
S3: It was precise
T: It was precise, wasn't it? Can you give me an example to illustrate that?
S5: Em...such as ...such as...if the argument ...(1.6) was...was...I know, Miss, I can't remember it
T: Yeah, ok, so she did use precise examples and she...what you two have done, you've gone through it, you really have gone through it line by line and made sure that you understand every line, and not just used the same words, so that was really good. So I noticed that you used some words like 'the unassailable' you put unattackable which is slightly different, but that...but that's good so you looked at what it means so you can't...you can't say it's wrong once you've agreed that all the stages of the argument fit, it logically fits...goes to that conclusion. So, well done. Ok em (1.4) one thing they say there em...you know the second one, it says' it would clearly represent an incredible achievement for human reason' because that's the thing about this argument, it this works, then you've proved that God exists, if you accept all the premises lead to the conclusion, because there's no other logical thing. So how would you attack this argument? If you're going to attack it, what would you attack? (2.3)
S2: The definition, isn't it?
T: Yeah, you could attack the definition because...then...the whole thing comes from the definition, or you say one of the stages doesn't work, or you say the whole style of reasoning doesn't work , ok? But, if you ...but ...if you go with it then that...then it is an amazing achievement, so that's what they're saying. So well done, you got that.
((Another Student gives feedback on their paragraph))
S11: (Unclear) one logically necessary (2.3)
S10: Answer
S11: Answer and once that's
T: Hang on, hang on, one logically necessary answer what...an answer implies a question, doesn't it?
S9: Ye:ah
T: So how could you say it differently?
S10: That God exists
T: So one logic...you could ...probably you need to say one logically necessary conclusion, ok? Go on, carry on=
S11: =Em...one step must follow another ...er if the argument can prove the point then humans have reasoned God into existence
T: Mm...mm...mm((shakes head)). Right, what's the difference between 'humans have reasoned God into existence' and saying you have proved the existence of God? What's the difference?
S11: Isn't proof like when you get evidence?

T: No, because, remember there's two types of proof. What ... did everyone hear G's question? Isn't proof when you give evidence, as in, do you mean evidence from the world?
S11: Ye:ah
T: Like science. So what kind of proof is that?
S11: Isn't that physical proof?
T: No, what kind of proof is it?
Other S shout out: A posteriori (teacher writes on board))
Well done, it's a posteriori. What are we talking about today? What type of proof are we talking about today?
Students shout out: A priori
T: Yeah, okay? So there are two different...they are completely different ways of working things out, okay? So, it's still proof, but it's a different type of proof. All right, what goes with a priori?
S4: The Ontological Argument
T: Yeah, it is, that's our example, but what's the word you've just been looking at?
Students shout out: deductive ((teacher writes on board))
T: Yeah and what's the opp=
Student: =inductive=
T: = Inductive,((T writes on board)) okay. So they're both proofs, but they're completely different ways of working things out, okay? So, what is the difference between, did you hear what G said? If we've reasoned God into existence what does that mean if we say that?
S6: That you've accepted that God exists
T: You've kind of made God exist, you've kind have (.) created God, yeah? So, to say that is different, because it's like saying God didn't exist...
S8: That means God didn't exist to make us
T: Yeah, it means that we made God ...we created God, whereas what Anselm
Students: (unclear)
T: No, but Anselm's saying that if you think about it logically then you can see God exists. Do you see the difference? Ok, Carry on, G
S11:((Continues to read from notes)) Before talking about God's existence, the reasons supporting its arguments have to be (.7) justified
T: Yeah, good.
S11: The concept of God is …em… what does that say (to S10)
S10: Already in our minds
S9: Already in our minds
T: Good (unclear) that's right
S9: The ontological argument should be certain about God's existence
T: Yes, that's right, if you accept all the reasons then it must lead to the conclusion, well done.

End of recording

Appendix U: L. 27.3.13

Lesson Observation 2 Transcript

((Teacher handing out sheets to class. Students sat in rows))

T: You should also have the ontological arguments (.) note and I'm going to come and check those individually ((organising sheets)) (7.6). In front of you, you should have ...em...your sheet from Friday, you should have your homework and you should have the homework from last week...this is what I'm talking about, the (final) Ontological Argument one, and it should be annotated in a lot of detail.
S1: Miss!
T: Yes, D
S1: Miss I'm confused what you mean by annotate, I[=
S2: = yes, I just] highlighted it
S1: Weren't we just supposed to read it or not?
T: Yeah, read it and then you're supposed to make notes on it as you went along
S1: But you're reading it so that's=
T:= Yeah but as you...just...it's a way of kind of focusing your attention. I'll come and have a look and see what you've done. Can you just get your homework out and I'm just going to set up, and then we'll be ready ((T sets up computer; students sort out work)) (30.7)
T: Ok, homework should be out. I'll just remind you, so the question was, and Mr C said it was pure ethics stuff, so you should all be fine with it: Explain how Kant's moral argument is deontological and absolute. (So (.3) could we ha:ve (.4) em let's have (.5) ((teacher looking round)) em, H, can you start us off with that? Can you read out your homework for us.
S3: Mine's kind of long though
T: That's alright, that's good ↑
S3: ((S reads out from her file))Kantian deontology can be seen as absolute as it includes a set of rules that apply to everyone in the world no matter what the situation is, the religious beliefs, and the status and power you have in society. The categorical imperatives can be seen as the (.3) em…deontology as it sees every moral act as good or bad in themselves so if you use Kantian ethics then rape is intrinsically wrong as the act itself is wrong (unclear) in any circumstances. ((Student addresses teacher))Then it talks about the three maxims
T: Yeah, go on, go on with that, that's really good, excellent start
S3: The first formulation is universalisation where Kant expects you to universalise the act you have in mind for everyone in the world and (unclear) the benefits of it apart from for yourself and you can see it as the right action. And the second formulation is humans as an end where you're supposed to treat people as an end not as a means to an end and because it (unclear) people to benefit you and you're supposed to treat them as themselves. And then the final formulation is the kingdom of ends so you treat everyone in society equally so you treat them for who they are.
T: Ok, well done. That's excellent em (.5) what...what...it's an excellent background into the Kantian ethics which is the stuff you've done with Mr C, probably what we need to work on now is getting it to be more (.3) linked with the moral argument but we haven't really clarified that yet, so that's what we're going to do today. But that's excellent, I'm sure Mr C would be very happy. I will come round and check everybody else's but has everyone else got something like that? So we're quite secure with that? Yeah. So what we need to sort out now is what is this specific argument, which is the argument for the existence of God, and how does Kant use the moral argument as an argument for the existence of God? Because

you've done it as an ethical theory ... an ethical theory, haven't we?
S4: So we could get a question on Kant from your section, couldn't we?
T: You could, yeah, but it won't be about ...it will be about how does Kant prove that God exists? That will be the angle that they're taking, ok? So, with that in mind, we're going to focus on these two (.2) if you look at the bottom of your sheet, you've got the three postulates of morality, is that new or have you done that with Mr C?
S5: It's new
T: That's what I thought. So that's the actual argument in a nutshell with three little…em... three points like that, ok? So we're going to do reciprocal teaching, we're going to teach each other, ok, just to remind us ((teacher refers to slides on the IWB)). So by the end of the lesson we will have done both bits of this and you'll be able to add to that. So you've now got the background but you need to be able to be specific about what the moral argument is. So, just to remind ourselves, B, when you're being (.4) the teacher what does a good teacher need to do when we're doing the reciprocal teaching
S6: Be clear
T: Yes, why is that important?
S6: So they can understand you
T: Yes, or they won't know what you're talking about, so being clear is very important. What else M, what else is going to be important when you're being the teacher?
S7: You know what you're doing?
T: Yes, so how are you...yes, that's very important. So how are you going to find out?
S7: By reading the full paragraph
T: Yes, so you've got to be really careful that you read it really carefully and know what you're talking about. Good. What else is going to be important, A, anything else?
S8: Explain in good details
T: Yes, good, and what do you mean by detail?
S8: Em...yes, being precise and=
T:= And what does preci...give me an example of how...how you might be precise, you're right, what would you do? (.4) Go on, L?
S9: Instead of, like, say in maths, instead of giving a (.4) em...say remainder something, you could give the exact decimal
T: You could, and how in philosophy would we do it?
S9:Instead of saying, like, the last name of a thinker, of a philosopher, you could write his full name and then the date he lived around.
T: You could ↑ That would be very...very detailed but even just to make sure you've got the right name of the thinker rather than just saying 'some people think', you had the name of the thinker and what else could you do as well? I mean in this case you haven't got anything because you've got key words but you're usually right because the names of the thinker would be really good and the context that the thinker lived in would be really good, and then an accurate quote would be good as well. The other thing that I really want you to focus on today is ...because this is not so much about the thinkers because we know, it's Kant's theory, what I want you to focus on here is the key words. So if you have a look, the bit we're going to do is this 'why are we moral' section at the end(.6) and one person is going to do the three postulates of morality, so you're going to need to do freedom, immortality and God. And then the second person is going to do the argument. So it's only a little, little bit I want you to teach today. So just to (.5) I think you've said most of the things that we normally say, that's good ((T reveals slide on IWB with reminders of how to conduct the reciprocal teaching task)). Oh yes, you've got to stay focussed. Miss and I watched the video the other day and noticed how well you

did that, actually, you did focus really well. So, I'm sure you can do that, today. Em...but yeah, being...being really precise about it. What about if you're being a good student? ((changes slide - prompts covered up)). Em...P?
S10: Listen?
T: That would be important, what else, T?
S11: Participate
T: What do you mean by participate?
S11: Put your hands up and=
T: = But when you're talking in a pair?
S11: No, no
T: When you're in a pair, how would you participate?
S11: Em...share your views?
T: Yeah, so you might share your views, you might...and asking questions would be really good. So I want to see the interaction between you that's really important ((teacher reveals prompts on IWB for being a good student)). So ((T reading from board)) you might take notes, asking lots of questions, all that's going to be important, ok. But this is second, ((teacher walks to the board and points to 'taking notes)). If this helps you, the taking notes, then do take notes as you go along, but it's kind of the conversation between you that I want to hear because that's where the learning is taking place, ok, so I can see that you're actually taking on board what the person is teaching you and thinking about it, ok? So this is what we're going to do now, then, it's only a short piece of text that I want to do today, so you're going to make notes on the text, remember you can't use the sheet when you...once you're teaching. Ok ((teacher organises class into pairs)). So the big focus today is going to be on the key words, your technical vocabulary, these are going to be the three words you can see there ((points to sheet)) Ok? So, first person, do the three postulates of morality; second person I'd like you to do the...em...I'd like you to be able to describe the moral argument. So, by...by the time we get to the end of the first lesson you should be able to do this without needing the sheets. Both of you should be able to do this without needing the sheets. Right guys, so this is writing, not the close reading thing, so you're going to write it first, then teach it. Ok, so you're going to make notes on the text for 5 minutes, and remember you're not allowed to use the book, the text, when you're teaching. So you have to have your really good notes when you're doing the teaching. Students released to work on their part of the text)). Could you put out your homework, so I can check it whilst you're doing this. (4 mins 51.8)
((Buzzer goes to denote end of preparation time)).
T: Right, is that enough time?
Students: No
T: How many people have finished? ((three hands go up)) A couple of people, ok, I'll come round and talk to you. I'll give you 2 more minutes, then, people who've finished I'll come and talk to you. Two minutes and then we've got to finish, alright? ((T hands out development task for finishers identifying statements that support or don't support the moral argument from second sheet))
(2 mins 3.7)

T: Just to remind you before we start, we've...you've got to make sure that the person understands the key words ok, so it's not enough just to tell them, I want you to actually check whether they understand it. So how would you check that they understand it?
S1: Test them
T: You might test them, D, yeah. So, I'm going to come round and listen and then...because we're actually going to use the words afterwards so you've got to make sure that both of you understand it. Ok? Alright, off you go.

((Students released to engage in reciprocal teaching task)). (7 mins 34.5)

T: OK, LET'S COME BACK TOGETHER. Right, well done, I heard some good teaching going on there, good questions being asked, that's really good. What I would like you to do now is, we're going to have a go at actually writing this up, so practising how you would write this for your real essay. Ok, so I only want a fairly brief ...em... fairly brief explanation and you can work on this in pairs. Ok, I know some of you are still working on the teaching, so I'm happy for you to carry on doing that while other people start working on this. So, outline Kant's moral argument, what are you going to need to include, D, what key words we're going to be looking for?
S1: Summum bonum
T: Yeah, M, what other ones are we going to look for?
S7: Perfect virtue?
T: Yeah, ok, so really, just the three there ((T points to the A3 sheet students are using)) the idea of the three...the postulates of morality and then you have to have the stages of the argument. I'm not going to tell you this but I would like you to see if you can do this yourselves, see if you can tell me what type of argument it is, whether inductive or deductive, and what it would have to do to succeed as a proof. So, if you can put that in as well, then we'll look at it together. So we have about another 5 minutes, so you can do this together, you can work on this together, and then we'll read them out afterwards, so you're writing your one or two paragraphs outlining Kant's argument in pairs and then we'll read them out. But remember to use the technical vocabulary that we've just been talking about. I don't mind now if you go back to look at your original sheets to see if you missed anything. ((Students released to work on paired writing task)).

((T discussing with a pair))
S11 Miss, you know for this, is it inductive or deductive?
S12: Yeah? (unclear) inductive?
S11: So how could that be=
T:= So what type of argument is this going to be?
S11: So do we look at the first sentence?
T: No, no, no, you look at the whole argument so you look at, the way you work out if it's inductive or deductive, you look at what's it based on, does it use evidence of the world or does it use the meaning of the word? Just the meaning of the word, so this argument what's it based on?
S12: Summum bonum
T: Which is what, is that evidence of the world?
S11: No
T: Is it not?
S12: Oh yeah, because it ...in order for that to happen you've got to exist
T: Well not...no, no, it's kind of the other way round, he says, well, this is...this is the actual argument that you want, isn't it, this bit here ((pointing to the bottom diagram on the sheet. T reads out from text))'So it's logical for perfect virtue to be rewarded by perfect happiness', what does perfect virtue mean?
S12: Em... perfectly...perfect moral goodness
T: Yeah, to have perfect moral goodness should be rewarded by happiness and then he says, but we can't...well in this lifetime does that happen? Do people get rewarded for being really=
S12: = No
T: No they don't, do they. So, he says, well, in that case if it's logical for ...to be rewarded, there has to be some kind of afterlife, yeah? And then, in that case, he says, well then...em... God must have to exist because he has to (unclear) have allowed it, yeah? So if you're starting from this, it's logical to have perfect

happiness and it's about us being moral beings, is that using ...is that to do with what the word means, is that to do with the definition or is that to do with our experience of life?
S11: It's definition
T: Is it?
S12: I think it's our experience,
T: It's our experience so that means it must be…
S12: Inductive
T: Inductive, yeah because the definition would have to be the meaning of the word moral or =
S11: That would be deductive, wouldn't it
T: That would be deductive
S11: Ok, I see.

((T visits another pair)).
T: Guys, what type of argument is it? Did you work it out, what type of argument is it?
S3: I don't really know
S4: Inductive
T: Why do you think it's inductive?
S4: Because there's a lot of conclusions that it could be
S3: But Kant said it absolute so it must be deductive
T: Right, so how do you work out whether it's inductive or deductive?
S3: It has possible conclusions
T: Yeah, that's it, it can be more than one possible conclusion, but that's not how you work it out, you look at...is it, do you do it be looking at evidence of the world or do you do it by looking at what the word means and unpacking the meaning of the word? So which is it?
S4: Oh, evidence from the world
T: Yeah, so which one must it be?
S3: Inductive?
T: Yeah, so that's how you work it out, ok? You're right, it does lead to more than one conclusion …more than one possible conclusion, but that's not how you work it out which is which.
S4: So, in an essay...if you outline the (moral) argument by (.4) would yo, you say it's inductive?
T: Yeah, so therefore, what does it have to do to succeed?
S4: Look at evidence from the world.
T: Yeah, and it has to show that he's... what he's saying is the most probable explanation, ok?
S3: But he talks [about
T: we need to] speed this up a little bit
S3: I'm not sure because I wrote that the first thing is 'it is logical for perfect virtue to be rewarded by perfect happiness', I said that it's logical that something good is rewarded by happiness, doing something good results in happiness, but that's not what he said.
T: Well, no, he's just saying that being perfectly good should have a reward
S3: So it is a good thing?
T: Yeah, it is and it...and it deserves a reward but can you...people who are perfectly good in this life, do they always get rewarded?
S3: No
T: So then, when...what does he say in that case?
S4: Does he say feeling good is a reward?
T: It's not feeling good, it's that if you do your duty and you are perfectly good you should be rewarded but in this life do people who do good stuff do they always get rewarded?
S4: No, so then what does he postulate must be the case? There must be a...(.5) there must be another life where people do get rewarded
S4: Ah, I get it↑

(2 mins 13.4)

T: Ok, we do need a bit more time, 4 more minutes and then we go through it.

((T engages with another student))

T: N, did you want some help?
S13: Yeah, I don't really understand (.6) it
T: Right, ok, so what's the actual argument?
S13: No, I understand this bit but not this bit ((points to the 3 postulates))
T: Ok, but that's the actual argument that you need=
S13: =Yeah but I don't understand this anyway
T: Alright, let's go through them then. Tell me what you do understand
S13: Well, that's just saying actions are moral because we have the free will to carry it out and there's nothing forcing us to do it
T: Right, otherwise it's not moral
S13: I don't get how you get from that to ...I don't understand why is it linked to immortality
T: Why does it have to be immortality? Do you know the answer to that? ((Addresses S14))
S14: Em...no...I know, I get=
T: = Because it kind of links in with this, doesn't it? ((T refers to bottom grid)) because it tells us that virtuous actions are not always rewarded so ↑all he's saying is (.4) right, if you do a good action=
S13: =But what...what's the difference between perfect virtue and virtue?
T: Well, just perfect virtue is like the best version of it, isn't it?
S13: But how will we know what [the best version is
T: Because you might be] virtuous, you might be a good person but not all the time, but perfect virtue would be you know, being virtuous all the time
S13: Yeah, but how would we know that?
T: We would know by the way that they're doing it based on their duty and we would know, according to Kant=
S13: =But what if you already did your duty but you kept getting like bad effects from it?
T: Yeah, and that's what he's saying, sometimes that happens, sometimes someone always does their duty and they always do the right thing and they don't get rewarded, so he's saying perfect virtue deserves to be rewarded so if it's not rewarded in this life, what do we have to postulate then?
S13: An afterlife
T: Yeah
S14: So the perfect happiness is heaven?
T: Yeah
S13: So are they meant to link?
T: Yeah, they do link in the sense that you have to have God in order to have heaven, don't you?
S13: I understand how these two link [immortality and God]but I don't understand how this one [freedom]
S14: Because you've got to be a good person to get into heaven, and then there can't be heaven without God.

LET'S COME BACK TOGETHER. And M and D, can you read yours first, please.

S7: We said Kant's moral argument is an inductive argument as it leads to the probable conclusion that God exists. ((reads from her own written work))His argument is deontological
T: Is what, sorry?
S7: Deontological
T: Deontological, yeah, well done.
S7: Kant argues that with reason we can prove God's existence. With the three postulates of morality we can see the necessary existence of God. Kant argues we must have freedom to carry out an act if we are to be moral. If we (unclear) the perfect virtue it should lead to the perfect happiness which we do not achieve in this world. Therefore, it must exist in another life and God is the necessary link between virtue and ...having virtue and happiness, Summum Bonum.
T: Good, that is so good. Why is it so good, H?
S9: Because she's used all the key words and she explained it well
T: She had all the key words and she explained it. They both knew it was an inductive argument. Now some of you were getting confused with the whole inductive thing, weren't you, because you were...em...how do you work out whether it's inductive or deductive. Go on, Y
S9: Me and Y came up with this, this is deductive, no, inductive when there's so many possible conclusions and then it goes down to deductive, when it reduces to one
T: Yeah↑that's good, that's good, I like that but also... it's a good idea, but also that's not...that might confuse you that is true, that is the implication of it but the way you work it out is, is it based on evidence of the world? If it is based on evidence of the world it's inductive, is it based on the meaning of the word, analysing the meaning of the word, if it's based on analysing the meaning of the word, it's deductive, remember? Ok, then that (.3) thing about conclusions helps as well.

End of recording

Appendix V: L. 19.4.13

Lesson Observation 3 Transcript

((T checking understanding of key terms with students. Lesson topic 'what is theodicy' in the context of examining the issue of 'the problem of evil'. Previous lesson had looked at arguments against existence of God in the face of the existence of evil suffering))

T: Now, to be a theodicy, there are certain rules that it has to abide by, what were the rules, (.4) Em, yeah, H?
S1: It must not (unclear) just deny the existence of God …evil, sorry
T: Evil, yeah, it mustn't deny the existence of evil and (.) it mustn't...?
S1: It must not qualify the nature of God
T: Excellent, and what does it mean to qualify the nature of God?
S1: Em (.4) that you have to stick to the definition↑
T: Yeah, because if you qualify the nature of God, you change your definition and you can't change your definition, well done. So, absolutely right ((T refers to IWB)). You're trying to defend, God...It mustn't deny the existence of evil, you can't say that evil's not real, you have to take it seriously. Ok, and it mustn't qualify (.4) the nature of God, it can't ...you can't...you have to stick with the orig...the rules that God has to be all powerful and all loving, Ok? So you're trying to show that that's true but that God has to have a good reason. Yeah, D?
S2: ((Unclear))
T: we haven't done it yet, that's what we're going to look at today although (.6) we did sta:rt, whose did we start looking at last lesson?
S2: St Augustine
T: Well done↑ St Augustine, ok? So, St Augustine ((refers to slides)) of Hippo, is a different Augustine so you don't want to get confused, this one ((points to picture on screen)) is Augustine of Hippo ...yeah, this is the one we're doing today. And he lived in the 4th century so you need to bear that in mind when you're thinking of it. Right, so, M, so what do you remember about what we did last time about him?
S3: Em (.7) I haven't got that much written in my notes
T: So what can you remember, yeah, go on
S4: Did he say, like, there's evil in the world because of the Fall
T: Because of the Fall, well one, and what do you mean by the Fall?
S4: When Adam and Eve ate the fruit when God [created
T: Excellent] and do you remember that's as far as we got last time we just looked at the story didn't we because you need to have the story. You need to be really secure on the story in order to kind of understand where he's coming from so just to quickly remind ourselves, so we said it was the story of Genesis (.2)… the world's created (.) How was the world when God creates it?
S4: Good
T: Good, completely good, yeah, and yeah, go on
S2: You said that evil's there because of the Fall but He created the serpent and the tree
T: Yeah, and that was one of the problems, yeah, so that's...that's a good thought, hold that thought and we'll come back to it when we're doing the critique. But just to explain the theodicy at the moment. So, A, can you remember how ...what does...how do they use repetition in Genesis, what's the bit they keep repeating?
S5: And it was good

T: They keep repeating that to make that idea everything God makes is good em...it all goes wrong wh:en (.4) what happens? Let's have ...
S6: When Eve eats the apple
T: It all goes wrong when...except it's not an apple, ok, it doesn't specify apple, ok. I know everyone thinks it's an apple but it never says...what does it say?
Students: Fruit
T: Fruit, yeah, go on N
S7: But isn't it...doesn't it all go wrong when the serpent comes along, first?
T: I suppose, yeah, yeah, you could say that, but in terms of the humans
S7: Yeah, then it's then
T: That's when for them it all goes wrong
S7: But isn't that moral evil still because the snake's choosing to [tempt
T: That's] like D has said, you have to explain why the snake's there in the first place in a perfectly good world and why is there a tree (.3) that you can choose that's going to cause all these problems in a perfectly good world? So, that's what we have to think about for when we're going to critique it. So...and that's when sin comes into the world when they choose to go against what God wants. So… em who do you think St Augustine is going to blame for evil and suffering in the world?
S8: Eve
T: Pretty much, yeah, it's Eve, but why particularly Eve?
S1: Because she ate the fruit
T: Yeah, not, she didn't just eat the fruit, that would be bad [enough
S1: Ah she] tempted Adam to eat the fruit as well
T: Yeah, and that has caused a lot of problems in saying that it was particularly her fault, well done. Em, so, it's both of their fault when they choose to disobey God. So, what we'll look at on Wednesday, we'll look at how we interpret the story because a lot comes down to how you're going to interpret this story, whether you interpret it as literally true or whether you interpret it as metaphorically true, ok, and we'll look at that. But today, I just want us to get our heads round what Augustine was(.) was saying and how he used it as a theodicy. So, I'm going to introduce you to new ideas, ok (refers to IWB). So this is where we are ((reads form slides)): Augustine says that everything that God makes is good and nothing is bad until the humans choose...choose to disobey God and that's when it all goes wrong. Ok, and that's what...that's what C was saying, that's called The Fall and that it's referred to as the Fall as it's like a fall from grace because everything was good beforehand and then it all goes wrong. Ok? You don't need to write this down because you've got your sheets anyway. Right, what I want to look at first of all, one of these key ideas is ((T checks slides)) Oh yeah, another thing to be aware of when we're talking about the Fall, it's not just humans where everything goes wrong with The Fall, it's also all of (.4) em the whole world was perfect before than, ok. Can you remember from what we looked at on Wednesday, what else went wrong? How did it change (.5) after the Fall?
S2: They got kicked out
T: They get kicked out but what=
S3: = God...God said that men...that Adam's going to have to start em…picking up from soil or something and then … em… he's creating pain for when...when the... Eve has to give birth=
T:=Good, and it wasn't like that before
S3: Yeah
T: Good, go on L
S9: I was going to say the same thing

T: So it's not just...it has a whole effect on the (.3) environment and the world as well, it's not just on the human beings, it changes the whole nature of things. Ok, right. These are the key words I want us to get, and this is on your sheets and this is something which is new so what we're going to look at in today's lesson, we're going to look at Augustine's Free Will theodicy and then we're going to look at his aesthetic version on Wednesday. So, today, we need to get the first half in your heads and then we'll critique it afterwards, ok? So ((T reads from board)), privation is a lack of something, so what I would like you to do is you can put that down and then put it into your own words and then I want you to give me some examples, so like it is on the sheet. Have a go at that now. (3.4)
S6: Miss, is that the same as deprivation?
T: It's the same word, yeah because if you're deprived you have a lack of something, that's right, it's the same root. (1 min 03.8) RIGHT, HAS EVERYONE HAD THE CHANCE TO DO THAT? REMEBER YOU CAN'T USE THE SAME WORDS THAT I'VE USED, you need to put it into your own words. Ok, right, I think most people have it now so talk to the person next to you, ok, and you've got to have it in your own words, you can't just say exactly the same as I've said and also some other examples, so I know that you understand it.

((Students released to share answers))(1 min 35.6)

T: RIGHT, WE'LL GO ROUND THEN, WE'LL HAVE SOME EXAMPLES OF...RIGHT. The first thing I want us to do is to make sure we understand what privation is, just what the word means, ok? Once we get that then we're going to look at what does it mean in terms of this story. Ok, can you explain in your own words, so you can't say the word 'lack' because I've said 'lack'. So, what...how would you explain if...if I didn't understand that privation is a lack of something, how could you explain it in your own words?
S1: Something that you're deprived of?
T: Except that...that's kind of the same yeah, alright, yeah it is something you're deprived of, or another way of saying it?
S10: Something (1.2) which you might be a necessity, no=
T:= Not even a nec… it doesn't even necessarily have to be a necessity ↑It could, go on, N
S7: Something you don't have enough of
T: Yeah, something you don't have enough of, something you don't have (.8) that's all it is, ok, right, it's not necessarily something you need, it's just a lack of ...it's something you could have but you don't have,(0.9) yeah? So, then he says evil is a privation of good, so let's just, before we go into that, let's just look at so a privation of something is ...so blindness is a lack of sight, em... Give another one, S
S8: A child without his mother?
T: Right, so what would the thing be that's evil?
S8: Orphan
T: Right, so the thing that's bad would be orphan and that would be a lack of having a mother, do you see how that...the way he's doing it? So he's saying blindness isn't a thing that's...he's saying blindness isn't a thing that's created in itself, what's the thing that's created? C?
S4: Sight
T: Sight, so like God creates sight is how he's saying it but a lack of sight is where the evil comes from, it's not that God created evil, it's God creates the good thing and when you don't have the thing that God creates, that's what we call evil.
S4: He said everything from God is good because God is good
T: Yeah, everything that God makes is good, so that everything that's bad is a lack of what God makes.

S2: So if everything is good, how comes it happens that you don't [have it?
T: How can] it have a lack? …Right, ok, let's be more specific than just 'if everything is good', what's stronger than 'good'? (.6) If everything is…?
S4: Why would we have a lack of anything in the world?
T: Yeah, so this is going to be one of the problems, if everything is perfect, and Augustine thinks that God that creates everything perfect, how could there be a lack of anything?
S2: Yeah, it don't make sense.
T: That's...you can put that down as one of your problems with it in a minute. I just want to make sure we're really clear about this...what privation is. So, H, can you give us another example, or you could say a privation of food.
S1: Starvation is a lack of food
T: Yeah, that's good, N?
S7: Homelessness is a lack of a home
T: Yeah, ok, so you see ...you see what he's getting at, you've got a good thing which God creates and then when you lack that good thing that's when you start having problems. But God doesn't create (.) the bad thing, he creates the good thing.
S9: What about (.5) ill…like diseases?
T: So it would be a lack of health=
S2: = But then if He makes it good how can it turn bad?
T: Well that's the problem. So, you're already going onto the next thing I wanted you to do, so the next thing I want you to try to think about is, if, once you've explained it, can you identify any problems with this idea and then if we accept the idea .6) em… does it have...does it mean that God has a good reason for allowing evil in the world? Because that's what Augustine is trying to show, because it's a theodicy, remember? So, is it working as a theodicy, do you think? Ok? So write that down. ((Students released to work on next section of their sheet)(2 mins 44.4)

((Teacher circulates and engages with individual students))

T: If we accept ...does it show that God's got a good reason for allowing suffering?
S6:I think that without evil (unclear)
T: Yeah so…but is it ...does it kind of get God off the hook because that's what he's trying to do isn't it? He's trying to say that you can't blame God for suffering, what he's trying to say is that God didn't make suffering, God made the good things, the suffering comes when you lack what God made, it's not God's fault
S6: Yeah
T: But do you think that works?
S7: I'm not sure about it because evil stuff which that it was…em (.6) that moral evil, things that humans do, that's not a lack of anything
T: It's a lack of ...not...it could be, though, isn't it, like if I (.5) emm… if I, if I =
S7:= So what am I lacking?
T: You're lacking morality, you're lacking compassion, you're lacking kindness, you're lacking empathy
S6: So it's up to us then, you can call it control, like (unclear)
T: No↓
S7: I don't get what she's saying, like we can't =
T:= No, but God creates what...what Augustine is trying to say is that God creates the good thing and then it's the lack ... N, WHAT ARE YOU DOING? HAVE YOU FINISHED? Let's come together again.

T: SO, LET'S HAVE SOME THOUGHTS ON THIS ONE, THEN. EM, N, THEN, YOU START US OFF. Did you think there were any problems with this idea of Augustine's?
S11:Yeah, because it says that God is, like, he's merciful, like the definition of God, like, if God could ...is like powerful and he cares about people then he should not allow lacking to happen.
T: Right, ok, because if God's perfect there shouldn't be a lack of anything?
S11: Yeah
T: Yeah, ok, and that's...part of the (.3) what Augustine is trying to defend, remember, because it's a theodicy…is that God is all powerful and God is perfect, he is trying to say that, so then that could be a problem, why would there be a lack of anything. Ok? Em... M what did you say? Any other possible problems with it?
S3: Yeah, if you said, if you said that, like, if everything God makes is good then who created evil because God (unclear)
T: Ah, right, ok. But, evil's not a created thing, that's what Augustine is trying to say, nobody creates...there is (.6) Go on ((lesson interrupted by message from duty pupil))
S2: So how do you get the serpent? ((T not hear))
T: Yes, that's an important point, evil's not created so this, this is what Augustine is trying to say, it's not God's fault, God didn't create evil, God is still completely good because God doesn't create anything that's bad.
S7: So then, when=
T: =So then you get the problem then how [come?
S7: yeah, exactly]
T: How can it go wrong if God doesn't create it, yeah↓ But just, see how you've used the word 'create' that's kind of what he's trying to say, God doesn't create anything that's not good. Yeah? So, that's...that's how he's defending God. D?
S2: So Miss, then if he says it's a lack then how does Satan and the serpent come in then, if it's a lack of something?
T: Right, [well that
S2: Because that doesn't] make sense to say it's a lack of something
T: Ok, well then this, this is not the whole of the theodicy so let's move onto the next bit because that will probably help us with the next bit. So the next bit we're going to look at is the idea of Free will ((T refers to slides))So, the idea of Free Will is the idea that (.3) right, do you remember what free will is?
S7: Making your own choices
T: Yeah, you can make your own choices, ok, so let's put that down, so you can choose between right and wrong (.4) just explain what that means first of all ((students write on sheet)) (14.9)

S4: So, Miss?
T: Yep
S4: You know as a criticism, could you have that (.4) because people believe that God is all knowing then if he, like, if he's all knowing wouldn't he have known that they would have taken an action =
T:= Yes, that is a problem, but let's have a look at...em let's have a look at this first of all because this kind of links in with this. Right, so, free will, the ability to choose what's…whether to do what's right and wrong and in the story of Genesis that takes the form of being able to choose to take the fruit of the tree, ok? So, Augustine thinks that it is...em…that God has to give people free will and it's better to have free will (.4) knowing that people are going to do wrong, so like, you're saying ((to S4)) like God's omniscient but still (.) it's better to give people free will than to not give them free will (.4) even knowing that they might (.) mess up, ok? So, to have a look at what Augustine's say...go on, D

S2: But there's no (unclear) the Genesis story, like, because it is the tree that gave them knowledge and that's how they got freedom
T: Yeah, so they had free will to eat the fruit
S2: No because the serpent told them to, so that's why they did it
T: No,no, they had a choice, but look, let's wait with the Genesis story, let's wait, let's do that when we look at how we interpret the story because a lot comes from that. N?
S7: Is this the actual definition of Free Will or is this Augustine's? ((pointing to slide on screen))
T: No, this is just my definition of free will. We 're going to look at Augustine's explanation now. So, if you look on the sheet, there's a quote there from Augustine explaining for himself this idea of what he thinks about Free Will, ok? So what I want you to do first of all, I want you to look through it, look at any words in the quote you don't understand, underline them and look them up, and then I want you to put Augustine's quote into your own words. Ok, so you cannot use the same words, it's got to be, it's got to be like you're doing a translation, ok, really, really closely wording it and looking at it really carefully and putting it into your own words underneath. Ok, and then once we've got that, we'll talk about it again.
((T circulates whilst students engage with task))
T: A, does that make sense? No? Let me have a look...So 'generosity', you know what that means? ((S gets dictionary and checks meaning)).

T: He is saying that, N, but why...why does he think that?
S7: It's better to sin?
T: No, not better to sin, better to have the choice even if it means you're going to sin
S7: But why [would he say that
T: Not better to sin], look at the difference
S4: Yeah, it's better to have the choice to sin than =
S7: =(unclear) do you have to say that?
T: It depends whether you think free will is important or not, right put it in your own words
(6.4)((T moves onto another student))
T: Exactly in your own words, D, not just a...just a general thing that's a kind of more or less a summary, I want word for word, so that, put that in your own words
S2:Ok
T: So what does generosity mean? (1.4)
(13.6)((T moves to another student))
T: Yeah, so you're saying exactly what he's saying, so he's saying 'the generosity of God is such' so how would you put that in your own words?
S6: Oh, I know, God would not [(stop himself)
R: That's not exactly] what he's saying, though, is it?
S6: What? So I have to do it every single word
T: Yeah, yeah, every single word, because this is an important quote, I want to make sure you understand it, alright, so make sure it's...((Looks over to other students in another part of the classroom)) Girls what are you doing?

T: Do you understand 'the generosity of God'?
S9: I know what generosity means, it's like when you're [generous
S11: giving]
T: What does generous mean?
S11: Like you're willing to give it because you're that nice
T: Because you're that nice ((laughs)). Ok, so it's something about the …goodness and the…?
S9: to be generous
T: But what does to be generous mean?
S9: To be nice

T: It's more than just being nice, though isn't it?
S11: To be loving?
T: You could sort of...he's kind of saying like it's in God's nature to give good things, that's what generosity...a generous person is someone who wants to give good things, it's always going to be positive stuff.
S6: Is it being unselfish...I mean selfless
T: Yeah, but generosity isn't the same as selfless, though, (.8) it's different
S4: Kindness?
T: It's linked with kindness but it isn't exactly the same as kindness
S2: What, generosity?
T: Yeah
S2: That's like...em (.9) you give...you give away
S7: Isn't it just giving for the sake of the person you give to
S2: Yeah
T: Yeah↑ So, it's saying something about God's nature, isn't he?

(7 mins 08.9)

T: Let's go through this line by line, because if you get this right, you're going to get a lot about what Augustine thinks, but you really have to properly understand it. Right, A, how did you interpret the generosity of God?
S5: I said a kindness
T: Kindness↑ did anyone have anything different to kindness? Because kindness isn't exactly the same as generosity, is it?
((Students shout out at once))
T: Well done, so S said he wants to give things. Em, N?
S7: I said the giving nature
T: Yeah, the giving nature, there's something about God's nature that he wants to give because you can be kind but it doesn't necessarily mean that you want to give things to people. You know, I could be kind to you but I might not necessarily be generous, I might...I might be but they do necessarily have to be the same thing. But here, it's saying that his nature is to give. ((T reads from slide on the screen)) 'is such that he has not stopped himself from creating the creature which he foreknew (1.2) would not merely sin but would determine to remain sinful'. So, C, how did you interpret that bit?
S4: Em (.5) that em...(unclear) that he makes he knows that will be full of sin and will be keep on being sinful
T: Yeah, 'and he did not stop himself', why do you think he uses that phrase, 'did not stop himself' because he could have used different words, couldn't he?
S2: Because he's all powerful so he could have=
T: =so he could have stopped (.5)
S1: He could have stopped, yeah
T: But he didn't, so there's some reason why he did not stop himself, even though he foreknew. Now, somebody said it earlier, he must have, was it you saying it earlier, that he must have had omniscience? So he's saying He knew this would happen, He knows that if he creates us like this, we're not just going to sin once, but we're going to sin and then maybe think (.5) I might ...I'm going to do it again. So he's saying that people don't just necessarily realise and then stop sinning they might say well actually I'm quite happy with it(1.6) yeah? What about the next bit, M? ((T reads from quotation)) 'As a runaway horse is better than a stone which cannot run away because it lacks self-direction and perception'
S3: A runaway horse is better than a stonewhich doesn't have the choice
T: It doesn't have the choice, and also the(.8)?
S3: Em, I don't know

T: Perception? What's perception?
S3: (unclear)
T: Yeah, perception is like how you understand the world and how you take in the world, so self-direction is the choice to do your own thing em… but also, to be able to take in like we're all perceiving each other now, aren't we? We're aware of where we are in the world. So the horse has got perception and the ability to choose. ((T reads last sentence)) 'So the creature who sins by free will is better than one that does not sin because it has no free will.' Right, T
S12: I'm not sure
T: You're not sure about this, this is the key to the whole thing. Do you want to try?
S12: I said that (.8) em… the creature that is either obedient or disobedient is better than one which is neither.
T: (.7) It's more than that because what's the key phrase that he uses?
S shouts out: FREE WILL
T: Free will, so did anyone come up with anything else for Free will?
S4: Is it to be able to [choose to do evil
S1: To make your own] decision
T: To make your own decision, so it's better to have something that can make its own decisions but makes bad decisions than have something that can't make any decisions (.8) that's what he's saying↓ So even knowing, that if you create us like we are when we can choose for ourselves you're going to make the wrong choice, that's still better than making it so that you have no choice. And that's what you have to think, whether Augustine is right about that. So you can start the sheet, explain Augustine's theodicy in your own words, you can do that. Then, does it work as a theodicy, does it show that it's not God's fault and then what's <u>your</u> opinion (.7)? Do you think a world with free will is better than a world without because if God had the choice he could have made a world without free will, so you're seeing if you agree with Augustine about that, ok? And we'll start the lesson with this on Wednesday.

End of lesson recording.

Appendix W: L. 8.3.13

L's Commentary on Observation 1

R: What do they have to do?
L: Emm, it was a sheet.... oh I know what it was, it was a revision (.) sheet and they had to put a few things (unclear) in four blocks for different perspectives on the Ontological argument (.4) and then a quote for each one, it's just like kind of a summary sheet to make sure that they had something for the key thinkers (.6) and if there's any gaps and (.5) some of them did have gaps, some of them had done(.) what most of them had done is what we'd done in lessons and then for the modern thinkers then they would have had to look that up and that kind of fed into that like what word (unclear) (1 min 13)
That conversation there, I'm not sure they're talking about the work, they look a bit too animated for that
R: That's the issue, though, isn't it, when they're released to do a shared discussion
L: Yeah, and the optimum time for me to get it read isn't the optimum time needed to discuss it. They don't need as long as it takes me to go round to discuss it(4.5) and they had gaps, I'm sure they had gaps, but they're not doing anything about it, they're just sitting there(.9) interesting. (7.8) See, they're doing it now, and that's because they know I'm about to ask them (4mins:16).
R: Big book?
L: That's the one they have on the desk, the big...textbook they make notes from. M is really good, she would do that.(3 mins.54). That's really common, they do that all the time. So, what R has just said is more or less what they always do in their essays which is why I picked up on it (.7) because I'm not...often if they don't quite understand it, that's what they'll do, they'll just say (.5) they've got a clear ...they've got the idea that it's something to do with (.) the idea and therefore got a gist but they can't see the like (.) the stages that lead to it.(6 mins. 21)((Discussion on internet as a source)). Oh, yeah, that's when they were looking stuff up on the Internet, and they looked it up with em (.) Google and they thought it was right, but it was the wrong context so it didn't make any sense. But she's obviously remembered that(3 mins.18).

R: How much wider reading do they do, do you reckon?

L: Hardly any ...I don't think they do much, but I think they do more now (.) because we bought them the textbooks (.3) so ...em...what we used to do is (.) photocopy things for them and give them to them, but now that they have the textbooks themselves it is (.) that is wider than what we can do in the class so (.) I think (.) they do but it's the wider reading that we give them as opposed to them going to get it but still (.3) we've kind of built it more into the course than we used to.

(1 min. 20)((Students self-ragging based on criteria on board about how confident they are with the Ontological Argument))
R: So what exact topic are they doing this for?

L: This is the Ontological Argument (.) so they've just (.2) finished (.)this is their last lesson on it. They had finished it but then I (.5) I knew they weren't, well I felt like they weren't (.) clear, which is what they said, they were amber so I wanted them to do the work by themselves but then I had to...I felt I needed to step that up because otherwise they wouldn't(unclear)

(1 min.38)

R: Where does that extract come from? The one you're using now?

L: Oh, I can't remember the name of the book. It's an A level book, I'll find it for you, it's not exam board specific, but it's one of the best explanations whereas the books they've got are written specifically for OCR because that's their exam board. (3 mins:53)

R: What did you want them to do?

L: So they read a line and then they explain it, so that close reading, and then the other one reads a line and ... and it took a really long time because they were struggling to (.) understand it but that was ok because I felt ... (that was good)

R: Are they used to this approach?

L: Mmm, yes, and also the feeding back at the end with the dice, so that way they know they all have to be ready.(6 mins 13)((Whilst students are doing close reading task))This is probably also why they don't do the wider reading because it's this much hard work (.2) to...to access the text so (.4) they do it in the lesson with a partner but do it on their own (.) like, you have to be quite dedicated to do that. It probably works also because it's not completely new, they have done the topic, so they have some idea of what they're trying to (.) do, but it's just em ....(1.3) and it's ...I mean it is a hard text, it used to be A2, for the other exam board it's an A2 text, so that's why it would be challenging for them(3mins.33). ((Referring to photocopied sheet they're working from))This is the bit they get confused with, inductive - deductive, that's why we did quite a lot on that because they're still not sure.
So that sentence, 'Ontological arguments for God's existence are supposed to be deductively valid' that sentence=

R: =there's a lot in that sentence, yeah.
L: And if they get that paragraph, then they'll find they've got the whole argument so there's a lot for them to (unclear). And that 'it follows necessarily' they find that really hard, but I think they do say that later on when they say about 'proof', they do say that, so it's getting the idea that that is the proof.(1 min:58). Well, they couldn't have done it at all at the beginning (15.7)It's good they're not skipping over it, they're actually looking in at it carefully
(1 min.18) Yeah, they are(.) I think also making an extra effort because it's an observed lesson, they're trying to be... I think they would probably need a bit more (.2) you know without...without the camera I think...I think they may need a bit more encouragement but it's good that they're doing it.

R: How does this compare with when they were doing it in previous groups or maybe last year=

L:= I mean yes, they did...they did do it like this↑ and they will (.) get on and do it line by line, they'll still do that but I think, just when it gets hard it's just much easier to...to talk about something else, and you have to say, 'right, come on'. But that it …that is what they do, they do get it line by line and they do look at it now, which is different to when they started. But I think it's just a perseverance thing.

R: It seems to be that activity is both modelling...well, slowing down and thereby, by doing that, modelling the reading process, so they've done the understanding of it, which again is like the

conversation you have with yourself, and then summary, ' what have I understood' which you might do by linking that within 5 minutes or so, but it's sort of like laying it bare, that's how it comes across to me.
L: And they're checking their understanding, as well. (2 mins: 10) See what she's done (listening to M's summary) is used the 'in other words' and she's gone through each line and put it into (.) translated it into other words.

End of recording.

Appendix X: L. 24.4. 13

L's Commentary on Observation 3

R: So, have they done this before?
L: Yes, they did this on Wednesday
L: ((commenting on the first part of the lesson and the story of Genesis)) We had to do quite a lot of that ...that groundwork because obviously they don't know the story so we spent a lot of time on that (.8) because you can't really critique it if you don't know the story. There are other ways of interpreting Genesis which they will look at in another lesson. That will confuse them, I think (3.6). So basically you've got three, you've got three levels; you've got the story itself, which you can't assume they know, so you've got to teach them the story; then you've got this step which is sort of starting to look at the (.9) Augustine, you know are there other views as well? (1.4) Yeah, this one and (unclear)
R: so...em...as a sort of spring board then into the different…positions or the different thoughts or schools or philosophies?
L: Yeah
R: And then on top of that they're going to have to then evaluate and critique them?
L: Yeah (3.4) and it's hard because they don't have a Christian understanding so I think some students do and assume you can take that as read but we've got to put all that foundation stuff in. (56) And the other layer I think is ...em...myth and whether it's a mythological story of if it's literal, and that'll be a whole thing because (1.2), yeah, they usually find that quite hard anyway, although we have done that, it links in with previous topics (.9) but when you critique it, you'll critique it differently depending on whether you think it's a factual story.

((Students putting the definition of privation in their own words))
L: See, that's quite hard, I wasn't sure if that was the right place to do that, because (1.2) I don't know, because I had to explain to them what privation was but then, and then I'll probably come back to that later when they've got (.6) but it ...it...I wonder if they felt it was a bit out on its own, the concept of privation.
R: They need it later, don't they?
L: Yeah, they need it, I kind of put it in as a foundation thing, really, but whether they'll link it in with that's Augustine because some of them then said 'what's Augustine saying' I said, 'no, this is what Augustine says' so I wasn't sure if they'd...but I thought it was better to start with a definition.
R: Because although it looks quite simple, privation equals a lack of something, put it in other words, it did help (.6) really consolidate and clarify because there was that misunderstanding wasn't there between something=
L: =A good thing and...and that's quite common, I think, if you don't go through it, they could easily get that mixed up
R: It's a nuance that needed to be made explicit.
L: the examples were good because they showed when they didn't understand because to say a lack of something, that's quite easy, it's just not having something but, yeah.

((Discussion after the definition and examples feedback))
L: see, I was going to go onto do the (.7) the next bit and show them (.8) em…Stepford Wives but I scrapped it because they took...it took them a long time to get that basic principle, and then the quote they found really hard as well, but I thought it was better to make sure they understood it before they start critiquing it, not

that I've really got time to do that ((laughs)) but there's no point moving until they get it.

L: ((refers to worksheet)) there's a lot in there, but if they get that then they've kind of got the whole thing. I was quite glad I did get them to do it because…
R: Yeah, generosity is a word you might expect them to know but foreknew is an unusual word, isn't it...em and even the concept of a runaway horse is =
L: = That took a bit of explaining as well because they didn't really understand why that would be a bad thing, even, that it ran away. So I think it was worth spending the extra time on it… but interestingly, when I was going round they all em...what they'd done is they'd summarised it really simply and oversimplified it and I had to go back and say, no, that's not what he's actually saying and then it took a lot longer because they had the gist of it, but that's not what I wanted them to have, just the gist of it.

((Reference to M's comment about evil being created))
L: See, that shows they didn't get it, definitely, well, she didn't (2.4) If she doesn't get it, then the rest of them probably don't get it. (45.7). I think she did understand it, I don't think she realised the connotation if you phrase it like that, it makes it…
R: So it's the precise use of words
L: It's precise use of language, yeah.

((Task where students render the quotation into their own words)).

R: Will they have to do a piece of extended writing on this?
L: They have to do an essay and it's quite hard because they have to...it could...it could be just one theodicy they often pick out one or the other where they have to say (.4) outline the theodicy and say whether it works (1.7) but it's easier than the other topics because it's quite (.4) they can get the concepts more easily than some of the other things they do…And it can be structures that's basically a basic structure ((referring to sheet)) then…sort of, it's working towards it, I'm trying to get them to evaluate it as they go along so they get it and evaluate it rather than putting all the evaluation at the end. So, yeah, it would follow that structure.

((Reference to discussion on the distinction between it's better to sin or it's better to have the choice to sin)).
L: ((Laughing)) but that's the point, they don't look it at carefully, that's what they thought he was saying and that's what they do, and then they get really angry with him for saying it, saying it's a stupid idea! And then N was saying…and she said to me 'yeah, but people don't sin, they don't carry on sinning, they don't deliberately will to sin', and that was really hard to explain because she has no concept of sin and it's not, and she was saying well, people just go and… I don't just go up and murder someone, but it's more subtle than that, and it was really hard to explain. But you don't always will to do the right thing in every situation and I had to...I had to come back to that. Because they, I think, they have quite a really simplistic understanding of it, like it's just like a big thing like murder or stealing or (.9) in which case people don't determine to keep doing it, but people do ...then when I said being selfish, then she said, well that's not a sin, so that's where it gets more complicated.
R: They're evaluating something in a paradigm that they're not part of
L: Exactly
R: So it's doubly removed maybe even triply removed

L: It is really removed, that's true, from what their experience is (.6) and that's one of the things you would assume, the word, sin, is shared vocab, but it's not at all, or the concept of it (24). They're so literal. That often happens thought because they think that critiquing it is to take the analogy and go off on a kind of (.4) tangent and then they think, well because it doesn't work for that it won't work at all. (2.5) Because that's what it is, that's what they're struggling with that the analogy doesn't have to be the same in everyway, whereas they think it does, because they think if the horse ...you can ride a horse but you can't ride a stone ((laughs))
(27) That was interesting as well, she looked at it and she thought when it says creatures she's translated it as ...she says the snake, she takes the creature to be the snake… em, and then I said I took it to be the human being, and that makes the whole thing different, and that's where she said the whole thing of (unclear) comes up as (unclear).

((Feedback on translating the quote))
((End of lesson))

R: It's really interesting, because it's just a small amount of text that needs unpacking
L: That's right, and in the past I might have skipped over that but then now, probably how my teaching's changed, now I take a tiny, tiny bit and take ages on it is probably better than a lot of ...than spending longer on something and also getting them to decipher it, the fact that they've had to work it out and hopefully that means they will remember it better than a simple text or when they look at a simpler text, which they will, it should make it easier.

End of recording.